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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

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SEBU7459-09
October 2005

Operation and Maintenance Manual

IT62G Series II Integrated Toolcarrier and 950G Series II and 962G Series II Wheel Loaders

AYA1-Up (Machine)
BAA1-Up (Machine)
AYB1-Up (Machine)
BAB1-Up (Machine)
BAC1-Up (Machine)
AYD1-Up (Machine)
BAD1-Up (Machine)
AYE1-Up (Machine)
AYG1-Up (Machine)
AYL1-Up (Machine)
AXR1-Up (Machine)
AXS1-Up (Machine)
AYS1-Up (Machine)
AXX1-Up (Machine)
AXY1-Up (Machine)

i02425994

Maintenance Interval Schedule

SMCS Code: 7000

Ensure that all safety information, warnings, and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance, including all adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, WHICH EVER OCCURS FIRST, in order to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

When Required

Automatic Lubrication Grease Tank - Fill 99
Automatic Lubrication Grease Tank - Fill 100
Battery - Recycle 102
Battery or Battery Cable - Inspect/Replace 102
Bucket Wear Plates - Inspect/Replace 110
Circuit Breakers - Reset 111
Engine Air Filter Primary Element - Clean/Replace 120
Engine Air Filter Secondary Element - Replace .. 121
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Fuel System - Prime 132
Fuses - Replace 136
Fuses - Replace 137
Oil Filter - Inspect 144
Radiator Core - Clean 146
Ride Control Accumulator - Check 147
Window Washer Reservoir - Fill 154
Window Wiper - Inspect/Replace 155

Every 10 Service Hours or Daily

Backup Alarm - Test 101
Bucket Cutting Edges - Inspect/Replace 105
Bucket Tips - Inspect/Replace 107
Cooling System Coolant Level - Check 114
Engine Oil Level - Check 127
Fuel System Primary Filter (Water Separator) - Drain 132
Hydraulic System Oil Level - Check 143
Quick Coupler - Check 145
Seat Belt - Inspect 148
Transmission Oil Level - Check 154
Windows - Clean 155

Every 50 Service Hours or Weekly

Bucket Lower Pivot Bearings - Lubricate 107
Cab Air Filter - Clean/Replace 110
Fuel Tank Water and Sediment - Drain 136
Tire Inflation - Check 151

Every 100 Service Hours or 2 Weeks

Axle Oscillation Bearings - Lubricate 101
Bucket Linkage and Loader Cylinder Bearings - Lubricate 106
Bucket Upper Pivot Bearings - Lubricate 110
Logging Fork Clamp - Lubricate 144
Steering Cylinder Bearings - Lubricate 149

Initial 250 Service Hours

Transmission Oil Filter - Replace 153

Every 250 Service Hours

Engine Oil Sample - Obtain 127

Every 250 Service Hours or Monthly

Battery - Clean 101
Belts - Inspect/Adjust/Replace 102
Brake Accumulator - Check 104
Braking System - Test 105
Differential and Final Drive Oil Level - Check 118
Drive Shaft Spline (Center) - Lubricate 119
Engine Oil (High Speed) and Oil Filter - Change .. 124
Engine Oil and Filter - Change 128
Quick Coupler - Lubricate 146

Initial 500 Hours (for New Systems, Refilled Systems, and Converted Systems)

Cooling System Coolant Sample (Level 2) - Obtain 115

Every 500 Service Hours or 3 Months

Cooling System Coolant Sample (Level 1) - Obtain 115
Differential and Final Drive Oil Sample - Obtain .. 118
Engine Crankcase Breather - Clean 123
Engine Oil (High Speed) and Oil Filter - Change .. 124
Engine Oil and Filter - Change 128
Fuel System Primary Filter (Water Separator) Element - Replace 133
Fuel Tank Cap and Strainer - Clean 135
Hydraulic System Biodegradable Oil Filter Element - Replace 139
Hydraulic System Oil Filter - Replace 142
Hydraulic System Oil Sample - Obtain 143
Transmission Oil Filter - Replace 153
Transmission Oil Sample - Obtain 154

Every 1000 Service Hours or 6 Months

Articulation Bearings - Lubricate 99
Battery Hold-Down - Tighten 102
Case Drain Screen (Strainer) (Steering Pump, Hydraulic Fan Pump, Motor) - Clean 111
Drive Shaft Support Bearing - Lubricate 119
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Fuel System Secondary Filter - Replace 134
Hood Tilt Actuator - Lubricate 138
Roading Fender Hinges - Lubricate 147
Rollover Protective Structure (ROPS) - Inspect .. 148
Steering Pilot Oil Screen (Command Control Steering) - Clean/Replace 150
Transmission Oil - Change 151

Every 2000 Service Hours or 1 Year

Brake Discs - Check 104
Differential and Final Drive Oil - Change 117
Engine Valve Lash - Check 131
Fuel Injection Timing - Check 131
Hydraulic System Oil - Change 140
Hydraulic Tank Breaker Relief Valve - Clean 144
Refrigerant Dryer - Replace 147
Service Brake Wear Indicator - Check 149
Steering Shaft (Command Control Steering) - Lubricate 150

Every Year

Cooling System Coolant Sample (Level 2) - Obtain 115

Every 3000 Service Hours or 2 Years

Engine Auxiliary Air Filter - Replace 122

Every 3 Years After Date of Installation or Every 5 Years After Date of Manufacture

Seat Belt - Replace 149

Every 4000 Service Hours or 2 Years

Hydraulic System Oil - Change 140

Every 6000 Service Hours or 3 Years

Cooling System Coolant Extender (ELC) - Add ... 113

Every 6000 Service Hours or 6 Years

Cooling System Water Temperature Regulator - Replace 116

Every 12 000 Service Hours or 6 Years

Cooling System Coolant (ELC) - Change 112

i02399592

Articulation Bearings - Lubricate

SMCS Code: 7057-086-BD; 7065-086-BD; 7066-086-BD

WARNING

Crushing Hazard. Insure that the machine ignition switch is in the OFF position and that the parking brake is engaged before entering the articulation area. Failure to do so could result in serious injury or death.

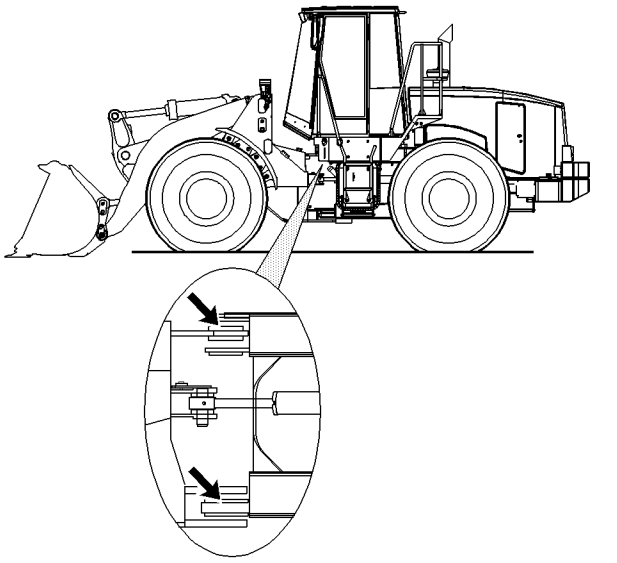


Illustration 130 g00763990

Wipe off all fittings before any lubricant is applied.

Apply lubricant through one fitting on the upper hitch and through one fitting on the lower hitch.

i02093114

Automatic Lubrication Grease Tank - Fill (If Equipped)

SMCS Code: 7540-544-TNK

S/N: AXR1-Up

S/N: AXS1-Up

S/N: AXX1-Up

S/N: AXY1-Up

The Lincoln Quicklub Lubrication System

Reference: Before any service work is performed on the lubrication system, refer to Special Instructions, REHS1396 or consult your Caterpillar dealer.

WARNING

A pressure hazard is present. Severe personal injury or death can result from removing hoses or fittings that are under pressure. Relieve the pressure in the system before you remove hoses or fittings.

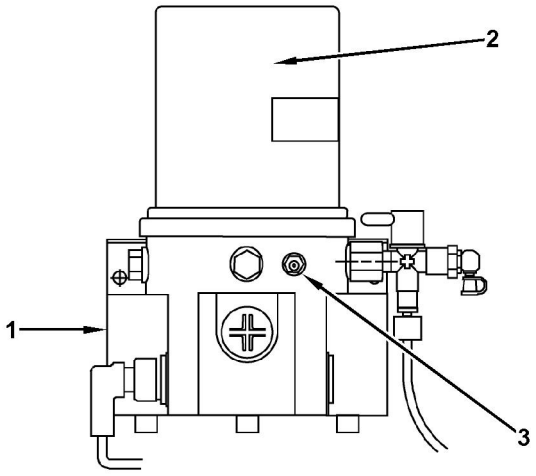


Illustration 131 g01067897

Filling the Reservoir

1. The Lincoln Quicklub pump (1) is located near the rear fender on the right side of the machine.

2. Fill the reservoir (2) through the grease fitting (3). The grease fitting (3) is located at the base of the reservoir (2).

   Reference: For the correct type of grease, refer to Operation and Maintenance Manual, “Lubricant Viscosities”.

3. Refill the reservoir when the grease reaches the “MIN” mark on the reservoir.

4. Fill the reservoir to the “MAX” mark on the reservoir.

Priming the System

After the reservoir has been filled with the recommended lubricant, loosen the fitting to the supply line. Operate the pump until lubricant flows from the outlet. Then, tighten fitting.

i02094776

Automatic Lubrication Grease Tank - Fill (If Equipped)

SMCS Code: 7540-544-TNK

S/N: AYA1-Up

S/N: BAA1-Up

S/N: AYB1-Up

S/N: BAB1-Up

S/N: BAC1-Up

S/N: AYD1-Up

S/N: BAD1-Up

S/N: AYE1-Up

S/N: AYG1-Up

S/N: AYL1-Up

S/N: AYS1-Up

The Groeneveld Automatic TWIN Greasing System

Reference: Refer to System Operation, RENR 6331for more information on the Automatic TWIN Greasing System.

⚠ WARNING

A pressure hazard is present. Severe personal injury or death can result from removing hoses or fittings that are under pressure. Relieve the pressure in the system before you remove hoses or fittings.

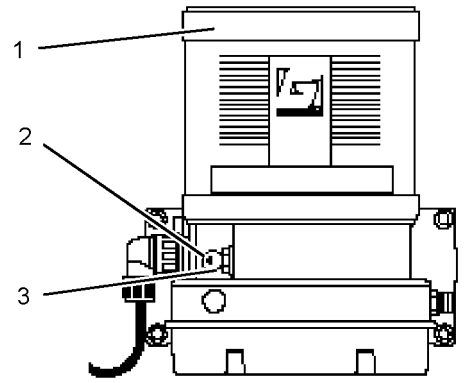


Illustration 132 g01068678

Grease reservoir (1) is located near the rear fender on the right side of the machine.

Filling the Reservoir

1. Remove the dust cap (2) from the grease reservoir (1).

2. Clean the filler tube assembly (3) and the coupling on the filler assembly.

3. Install the filler assembly onto the filler tube assembly (3).

4. Fill the grease reservoir (1) with grease to the maximum level which is indicated on the grease reservoir (1).

   Reference: For the correct type of grease, refer to Operation and Maintenance Manual, “Lubricant Viscosities”.

5. Remove the filler assembly and install the dust cap (2).

i02405757

Axle Oscillation Bearings - Lubricate

SMCS Code: 3268-086-BD; 3278-086-BD

⚠ WARNING

Crushing Hazard. Insure that the machine ignition switch is in the OFF position and that the parking brake is engaged before entering the articulation area. Failure to do so could result in serious injury or death.

Wipe off all fittings before you apply any lubricant.

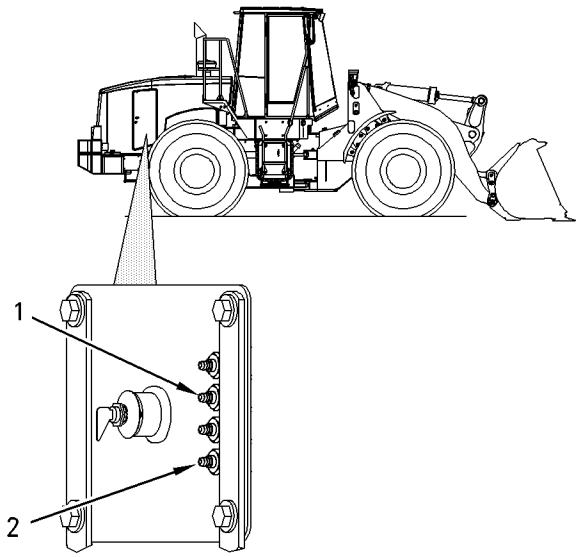


Illustration 133 g00752649

Open the access door on the right side of the machine.

Apply lubricant through two remote fittings (1) and (2).

i01461788

Backup Alarm - Test

SMCS Code: 7406-081

Turn the engine start switch to the ON in order to perform the test.

Apply the service brake. Place the transmission into reverse.

The backup alarm should start to sound immediately. The backup alarm will continue to sound until the transmission is placed into neutral or into forward.

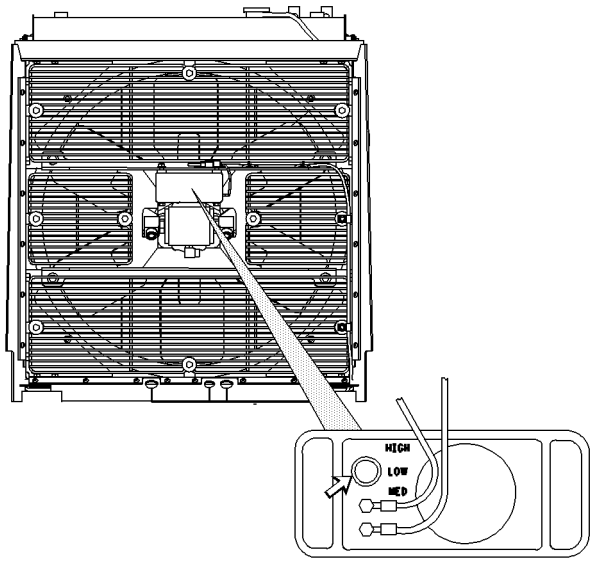


Illustration 134 g00764199

A three-position switch on the backup alarm regulates the volume of the alarm. The backup alarm is located on the rear of the machine.

The backup alarm is set for the highest sound level when the machine is shipped from the factory. The setting should remain on HIGH unless the job site requires a lower sound level.

i01461884

Battery - Clean

SMCS Code: 1401-070

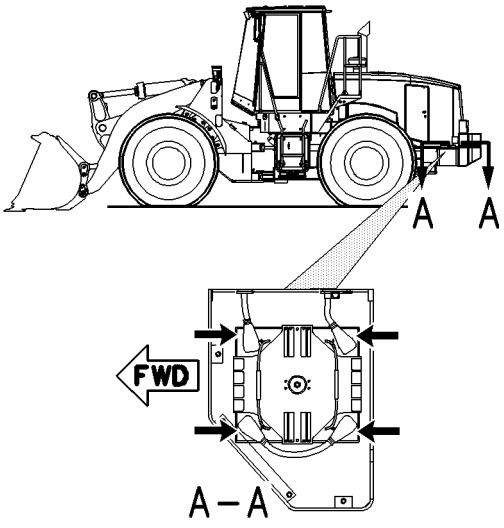


Illustration 135 g00764246

Open the battery compartment on the left rear side of the machine.

Clean the battery terminals and the surfaces of the batteries with a clean cloth. Coat the battery terminals with petroleum jelly. Make sure that the battery cables are installed securely.

i00993589

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i01461907

Battery Hold-Down - Tighten

SMCS Code: 7257-527

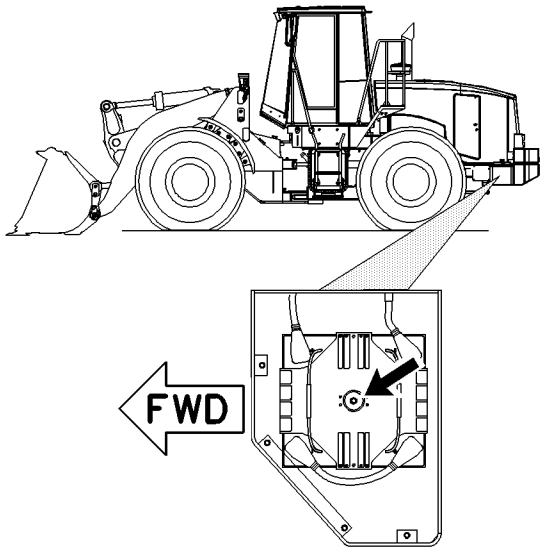


Illustration 136 g00764269

Open the battery compartment on the left rear side of the machine.

Over time, the vibration of an operating machine can cause the battery hold-down to loosen. To help to prevent loose batteries and the possibility of loose cable connections, tighten the locknut in the center of the hold-down to a torque of 14 ± 3 N·m (10 ± 2 lb ft).

i01770834

Battery or Battery Cable - Inspect/Replace

SMCS Code: 1401-040; 1401-510; 1402-040; 1402-510

1. Turn the engine start switch key OFF. Turn all of the switches OFF.
2. Turn the battery disconnect switch OFF. Remove the key.
3. Disconnect the negative battery cable from the disconnect switch.

Note: Do not allow the disconnected battery cable to contact the disconnect switch.

4. Disconnect the negative battery cable at the battery.
5. Disconnect the positive battery cable at the battery.
6. Inspect the battery terminals for corrosion. Inspect the battery cables for wear or damage.
7. Make any necessary repairs. If necessary, replace the battery cables or the battery.
8. Connect the positive battery cable at the battery.
9. Connect the negative battery cable at the battery.
10. Connect the battery cable at the battery disconnect switch.
11. Install the key and turn the battery disconnect switch ON.

i01437375

Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510; 1397-025; 1397-040; 1397-510

Your machine is equipped with a single serpentine belt. Stop the engine. Open the rear hood. The belt is located at the rear of the engine. Inspect the condition of the serpentine belt. Replace the belt if the belt is worn or frayed.

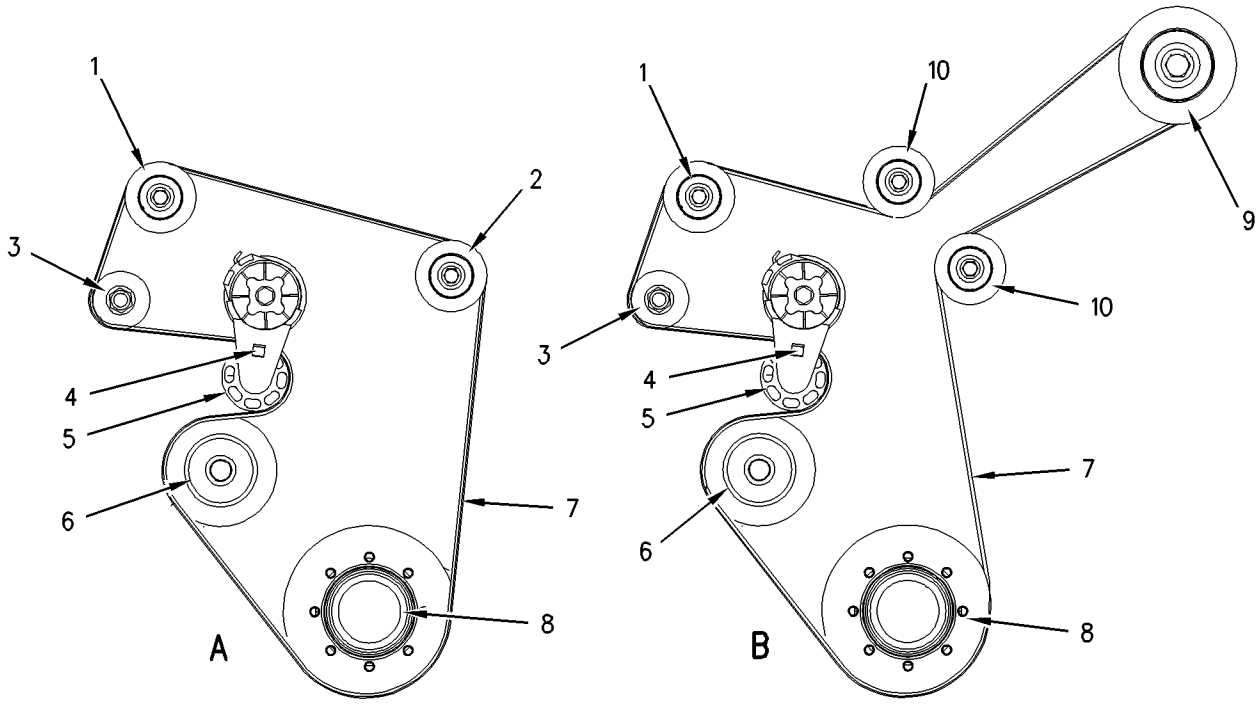


Illustration 137 g00752925

(1) Idler Pulley
(2) Idler Pulley
(3) Alternator
(4) Square Hole
(5) Tensioner
(6) Water Pump
(7) Serpentine Belt
(8) Crankshaft Pulley
(9) Compressor (If Equipped)
(10) Idler Pulley

A tensioner (5) keeps the correct tension on the belt (7). Insert a ratchet with a square drive into the hole (4). Rotate the tensioner counterclockwise in order to relieve tension on the belt. Remove the belt.

Install the new belt. Be sure that the new belt is routed correctly, as shown. View (A) represents machines that are not equipped with an air conditioner. View (B) represents machines that are equipped with an air conditioner. Rotate the tensioner counterclockwise in order to install the new belt. Release the tensioner when the new belt is installed. The correct tension will automatically be applied.

Belt for the Axle Oil Cooler Pump (If Equipped)

1. Open the engine hood in order to access the axle oil cooler pump.

2. Inspect the condition of the belt. If the belt is cracked or frayed, replace the belt.

3. Use a BT-33-97 Borroughs Gauge to check the tension of the belt.

The tension of a used belt with more than 30 minutes of operation at rated speed should be 400 ± 44 N (90 ± 10 lb). The tension of a new belt with 30 minutes of operation or less at rated speed should be 534 ± 22 N (120 ± 5 lb).

Adjusting the Tension of the Belt for the Axle Oil Cooler Pump

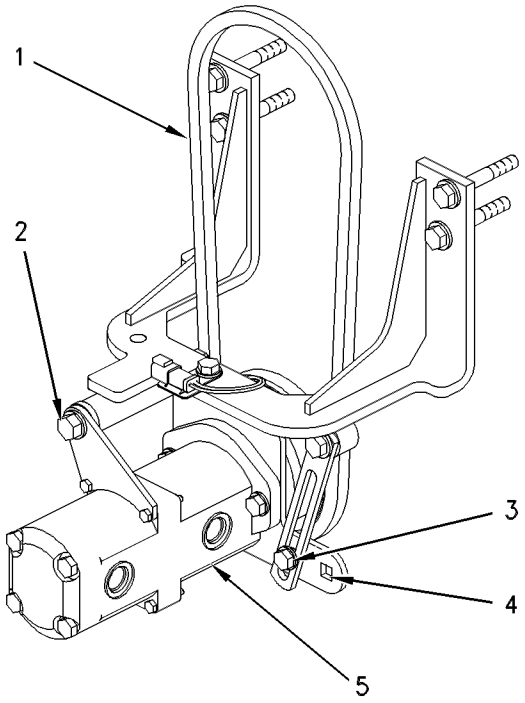


Illustration 138 g00592147

1. Loosen one mounting bolt (2) and adjustment bolt (3).
2. Insert a ratchet with a square drive into the hole in mounting bracket (4). Use the ratchet as a lever to rotate axle oil cooler pump (5). Rotate the axle oil cooler pump until the correct belt tension is reached.
3. Tighten adjustment bolt (3) and mounting bolt (2).
4. Recheck the tension of belt (1). If the tension of the belt is incorrect, repeat the adjustment procedure.

i01714079

Brake Accumulator - Check

SMCS Code: 4263-535

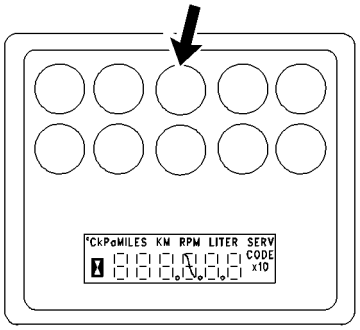


Illustration 139 g00882020

1. Turn the engine start switch to the ON position. The alert indicator for brake oil pressure should come on if the braking system is not at normal operating pressure.
2. Start the engine. Run the engine at half speed for two minutes in order to increase the accumulator pressure. The alert indicator for brake oil pressure should go off.
3. Stop the engine. Apply the service brake pedal and release the service brake pedal until the alert indicator for brake oil pressure comes on. This will decrease the accumulator pressure. A minimum of five applications of the service brake pedal are required.
4. If the alert indicator comes on after less than five applications of the brake, measure the accumulator precharge pressure. An authorized Caterpillar dealer can measure the nitrogen gas pressure in the accumulator. Use only dry nitrogen gas for recharging.

i01732078

Brake Discs - Check

SMCS Code: 4255-535

Reference: For the correct procedure, refer to the Testing and Adjusting Service Manual of the braking system for your machine or consult your Caterpillar dealer.

i01739721

Braking System - Test

SMCS Code: 4251-081; 4267-081

- Fasten the seat belt before you test the brakes.
- Park the machine on a dry, level surface.
- Check the area around the machine. Make sure that the machine is clear of personnel and clear of obstacles.
- Make sure that the steering frame lock is in the unlocked position.

The following tests are used to determine whether the braking system is functional. These tests are not intended to measure the maximum brake holding effort. The required brake holding effort for sustaining a machine at a specific engine rpm varies from one machine to another machine. The variations include differences in the engine setting, the power train efficiency, the brake holding ability, etc.

Service Brake Holding Ability Test

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move during test, reduce the engine speed immediately and engage the parking brake.

1. Start the engine. Raise the implement slightly. Apply the service brake. Release the parking brake.
2. Move the transmission control to THIRD SPEED FORWARD while the service brakes are applied. Make sure that the autoshift control is in the OFF position.
3. Gradually increase the engine speed to high idle. The machine should not move.
4. Reduce the engine speed to low idle. Move the transmission direction control to the NEUTRAL position. Engage the parking brake. Lower the implement to the ground. Stop the engine.

If the machine moved during the test, consult your Caterpillar dealer for a brake inspection. Make any necessary repairs before the machine is returned to operation.

Parking Brake Holding Ability Test

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move, reduce the engine speed immediately and apply the service brake pedal.

This test is performed when the parking brake is engaged. If the machine begins to move, compare the engine rpm to the engine rpm of a prior test. This will indicate the amount of system deterioration.

1. Start the engine. Raise the implement slightly. Engage the parking brake.
2. Move the transmission control to THIRD SPEED FORWARD. Make sure that the autoshift control is in the OFF position.

   The parking brake indicator light should come on.
3. Gradually increase the engine speed to high idle. The machine should not move.
4. Reduce the engine speed to low idle. Move the transmission direction control to the NEUTRAL position. Lower the implement to the ground. Stop the engine.

If the machine moved during the test, consult your Caterpillar dealer for a brake inspection. Make any necessary repairs before the machine is returned to operation.

i02196469

Bucket Cutting Edges - Inspect/Replace

SMCS Code: 6801-040; 6801-510

⚠ WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket cutting edges.

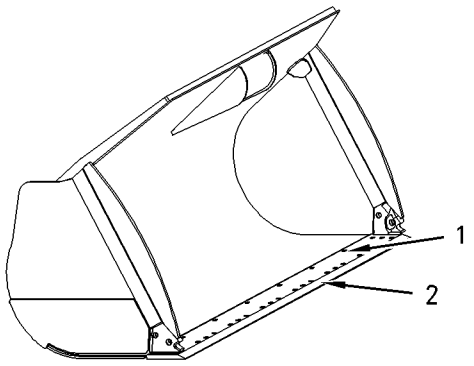


Illustration 140 g00764365

Check the cutting edges and the end bits for wear and for damage. Use the following procedure to service the cutting edges and the end bits:

1. Raise the bucket and place blocking under the bucket.
2. Lower the bucket onto the blocking. Stop the engine.
3. Remove bolts (1), cutting edge (2) and the end bits.
4. Clean all contact surfaces.
5. If the opposite side of the cutting edge is not worn, use the opposite side of the cutting edge. The end bits are not reversible.

   If both sides are worn, install a new cutting edge.
6. Install bolts (1). Tighten the bolts to the specified torque.

   Reference: Refer to Specifications, SENR3130, “Ground Engaging Tool (G.E.T.) Fasteners”.
7. Start the engine. Raise the bucket and remove the blocking. Lower the bucket to the ground.
8. After a few hours of operation, check the bolts for proper torque.

i01897623

Bucket Linkage and Loader Cylinder Bearings - Lubricate

SMCS Code: 5102-086-BD; 5104-086-BD; 6107-086-BD

Integrated Toolcarrier

Wipe off all of the fittings before you apply any lubricant.

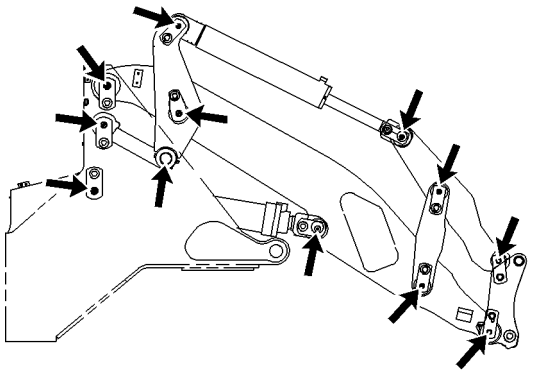


Illustration 141 g00764050

Apply lubricant through twelve fittings on each side of the machine.

There are a total of 24 fittings.

Wheel Loader

Wipe off all fittings before any lubricant is applied.

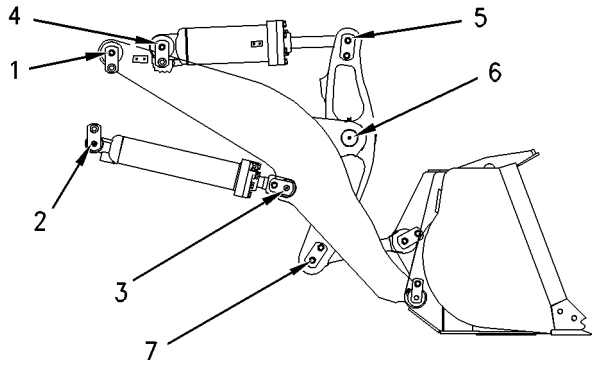


Illustration 142 g00987705

Apply lubricant through fittings (2) and (3) on both lift cylinders. Apply lubricant through fittings (5), (6) and (7).

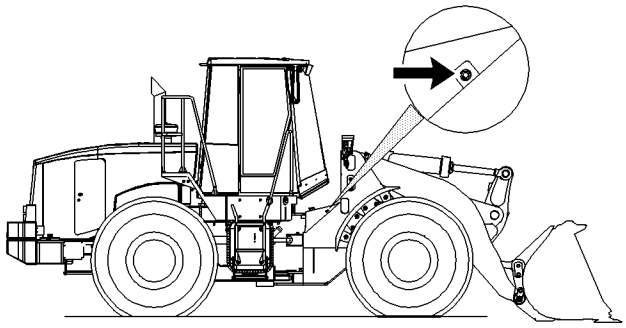


Illustration 143 g00765618

For pin joint (1), apply lubricant through one remote fitting on each side of the machine.

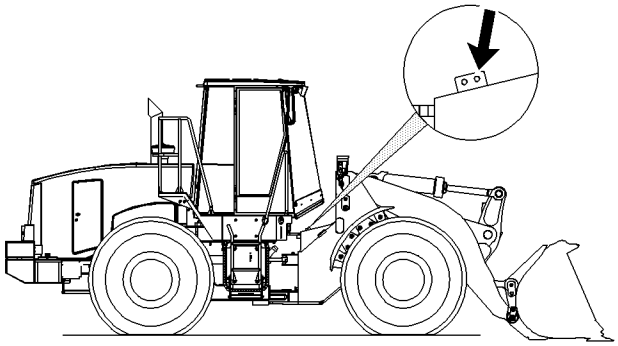


Illustration 144 g00765808

For pin joint (4), apply lubricant through a remote fitting on the right side of the machine. Use the fitting that is toward the front of the machine.

i01897748

Bucket Lower Pivot Bearings - Lubricate

SMCS Code: 6101-086-BD; 6107-086-BD

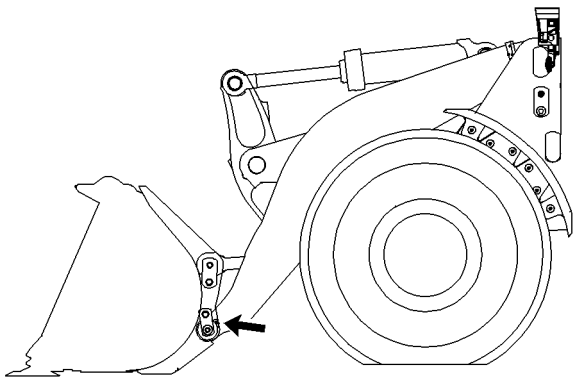


Illustration 145 g00987389

Wipe off all fittings before any lubricant is applied.

Apply lubricant through one fitting on each side of the machine.

i02421156

Bucket Tips - Inspect/Replace

SMCS Code: 6805-040; 6805-510

WARNING

Personal injury or death can result from the bucket falling.

Block the bucket before changing bucket tips.

⚠ WARNING

Personal injury can result from driving out retainer pins.

Retainer pins, when struck with force can fly out and cause injury to nearby people.

Make sure the area is clear of people when driving out retainer pins.

Wear protective glasses when striking a retainer pin.

Bucket Tips

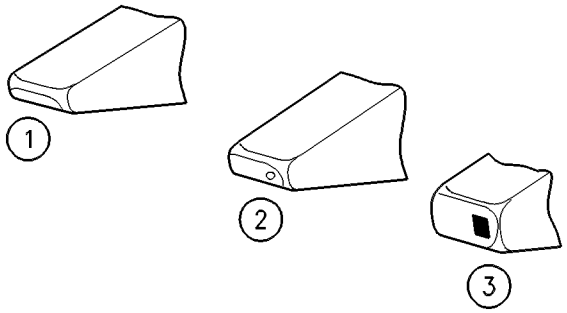


Illustration 146 g00101352

(1) Usable
(2) Replace this bucket tip.
(3) Overworn

Check the bucket tips for wear. If the bucket tip has a hole, replace the bucket tip.

The loss of bucket tips can often be attributed to the improper installation of the retaining pin into the tip and the adapter. Bucket tips are lost more frequently on excavators because the tips are closer together. Inserting the pin from the correct side (right side) of the adapter is difficult due to the small gap. More clearance can be obtained by installing the pin through the tip and the adapter from the left side, and then by driving the pin against the retainer. This procedure will often cause the spiral retainer to become distorted, resulting in either a loss of retainer grip or an increased difficulty in removing the pin.

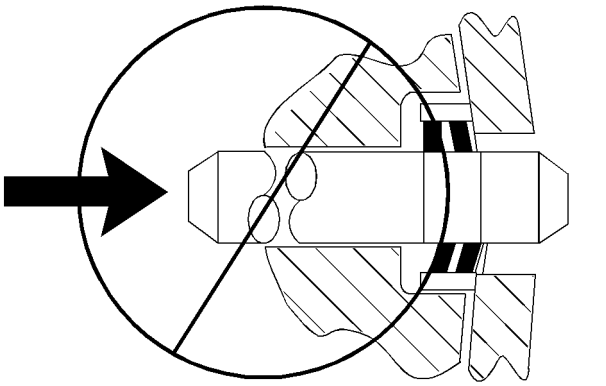


Illustration 147 g01201331

Improper installation

By driving from the right side of the adapter, the retainer is properly supported by the counterbore of the adapter. This procedure will show that the pin chamfer is centered in the inside diameter of the retainer more clearly.

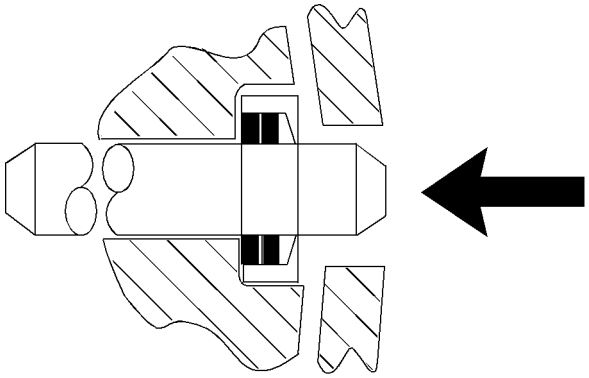


Illustration 148 g01201332

Proper installation

Install pin from the right side.

1. Remove the pin from the bucket tip. The pin can be removed by one of the following methods:

   - Use a hammer and a punch from the retainer side of the bucket to drive out the pin.
   - Use a Pin-Master. Follow Step 1.a through Step 1.c for the procedure.

   a. Place the Pin-Master on the bucket tooth.

   b. Align extractor (5) with the pin.

   c. Strike the Pin-Master at the back of the tool (4) and remove the pin.

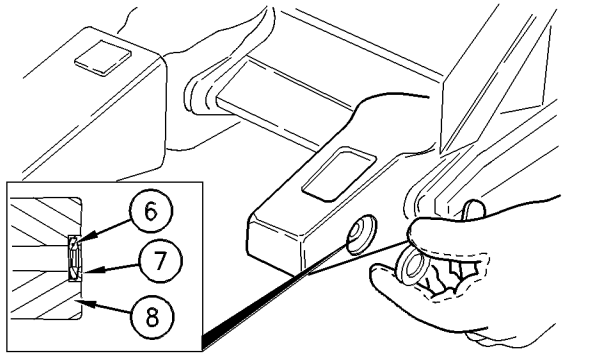


Illustration 149 g00590819

(6) Retainer
(7) Retaining Washer
(8) Adapter

2. Clean the adapter and the pin.

3. Fit retainer (6) into retaining washer (7). Install this assembly into the groove that is in the side of the adapter (8).

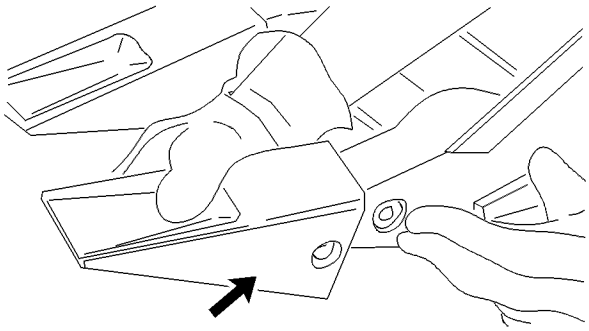


Illustration 150 g00101359

4. Install the new bucket tip into the adapter.

Note: The bucket tip can be rotated by 180 degrees in order to allow greater penetration or less penetration.

5. Drive the pin through the bucket tip. The pin can be installed by using one of the following methods:

- From the other side of the retainer, drive the pin through the following components: the bucket tip, the adapter, and the retainer.
- Use a Pin-Master. Follow Step 5.a through Step 5.e for the procedure.

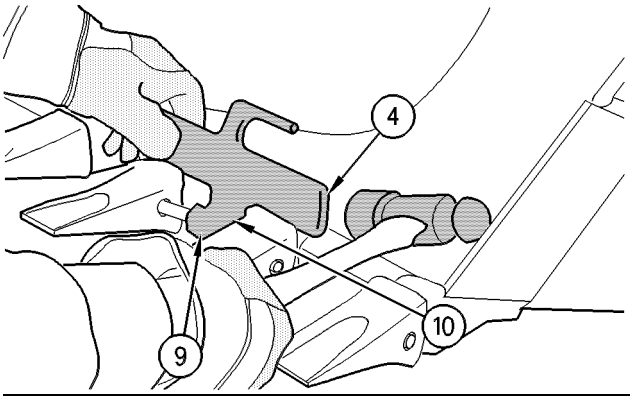


Illustration 151 g00590666

(4) Back of Pin-Master
(9) Pin setter
(10) Pin holder

a. Insert the pin through the bucket tooth.

b. Place the Pin-Master over the bucket tooth and locate the pin in the hole of the holder (10).

c. Strike the tool with a hammer at the back of the tool (4) in order to start the pin.

d. Slide pin holder (10) away from the pin and rotate the tool slightly in order to align pin setter (9) with the pin.

e. Strike the end of the tool until the pin is fully inserted.

6. After you drive the pin, make sure that the retainer fits snugly into the pin groove.

The tools that are available for driving the pins are shown in Table 16.

Table 16

Size of the Tip	Pin Remover
J200, J225	143-2459
J250, J300, J350	143-2460
J350, J400, J460	196-1331
J550	203-4290

i01897750

Bucket Upper Pivot Bearings - Lubricate

SMCS Code: 6101-086-BD; 6107-086-BD

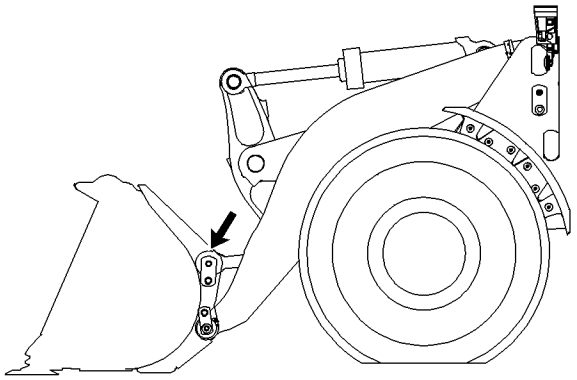


Illustration 152 g00987399

Wipe off the fitting before any lubricant is applied.

Apply lubricant through the fitting.

i01709216

Bucket Wear Plates - Inspect/Replace

SMCS Code: 6120-040; 6120-510

⚠ WARNING

Personal injury or death can result from the bucket falling.

Block the bucket before changing bucket wear plates.

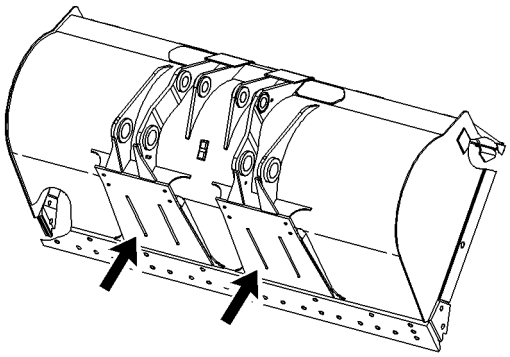


Illustration 153 g00879740

Inspect the wear plates. Replace the wear plates before damage to the bottom of the bucket occurs. Consult your Caterpillar dealer for replacement of wear plates.

i01449996

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

Note: Clean the cab air filters more often if the machine is being operated in dusty conditions.

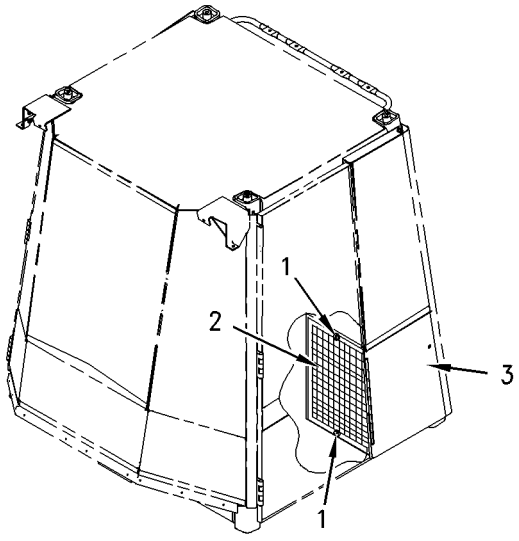


Illustration 154 g00759048

1. Remove the filter cover behind the seat. Two threaded knobs (1) are used in order to remove the cover. Remove the filter element (2).

2. Open the access door (3) on the left side of the cab. Remove the filter element.

3. Clean the filter elements with pressure air or wash the filter elements in warm water with a nonsudsing household detergent.

4. If water and detergent are used to clean the filter elements, rinse the filter elements in clean water and allow the filter elements to air dry thoroughly.

Note: If either filter element is damaged, install a new filter element.

5. Install the filter elements. Install the filter cover and close the access door.

i02067499

Case Drain Screen (Strainer) (Steering Pump, Hydraulic Fan Pump, Motor) - Clean

SMCS Code: 4304-070-Z3; 5057-070-Z3

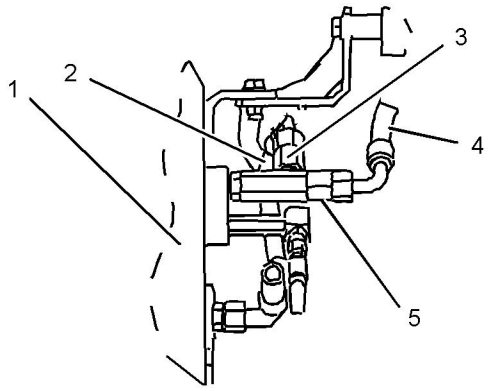


Illustration 155 g01059455

Case drain screen (3) and case drain screen (5) are located in hydraulic line (2) and hydraulic line (4). Hydraulic line (2) and hydraulic line (4) are located behind the hydraulic oil tank (1). Hydraulic line (2) is the case drain for the hydraulic fan pump. Hydraulic line (4) is the case drain for the steering pump.

1. Disconnect the hydraulic line (2) from the hydraulic tank (1).

2. Remove the case drain screen (3) from the hydraulic line (2).

3. Wash the case drain screen (3) in a clean nonflammable solvent.

4. Dry the case drain screen (3) by using pressurized air.

5. Inspect the case drain screen (3) for damage.

Note: If the case drain screen (3) is damaged, replace the case drain screen (3).

6. Install the case drain screen (3).

7. Connect hydraulic line (2).

8. Repeat Step 1 through Step 7 for hydraulic line (4) and case drain screen (5).

i02126545

Circuit Breakers - Reset

SMCS Code: 1420-529

Circuit Breaker Reset – Push the button in order to reset the circuit breakers. The button will stay depressed if the circuit is working properly. Check the appropriate electrical circuit if the button does not stay depressed.

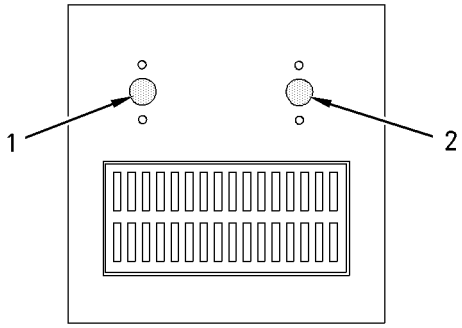


Illustration 156 g00753091

Two circuit breakers are located in the cab behind the operator's seat. These circuit breakers are located behind the fuses.

(1) Heating and Air Conditioning system ..... 15 Amperes

(2) Operator Seat ..... 15 Amperes

Note: Machines that are equipped with electrohydraulic controls and conventional steering will not have circuit breakers that are located in the cab.

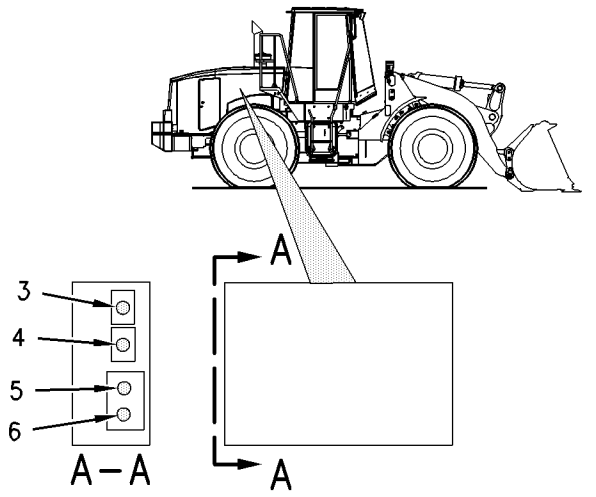


Illustration 157 g00753113

Circuit breakers are also located in the engine compartment on the right side of the machine.

(3) Alternator ..... 80 Amperes

(4) Main Circuit ..... 80 Amperes

(5) Cab ..... 15 Amperes

(6) Engine ..... 20 Amperes

i01732072

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044-NL

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Topping off or mixing Cat ELC with other products that do not meet Caterpillar EC-1 specifications reduces the effectiveness of the coolant and shortens coolant service life.

Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants. Use only Extender with Cat ELC.

Failure to follow these recommendations can result in shortened cooling system component life.

Reference: For information about the addition of Extender to your cooling system, see Operation and Maintenance Manual, “Cooling System Coolant Extender (ELC) - Add” or consult your Caterpillar dealer.

If an Extended Life Coolant was previously used, flush the cooling system with clean water. No other cleaning agents are required. Use the following procedure to change the Extended Life Coolant.

The cooling system pressure cap is located under the hood at the rear of the machine.

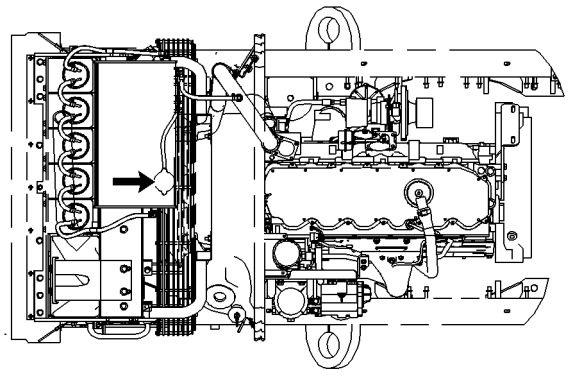


Illustration 158 g00753186

1. Slowly loosen the cooling system pressure cap in order to relieve system pressure. The pressure cap is located on top of the radiator tank on the left side of the machine.

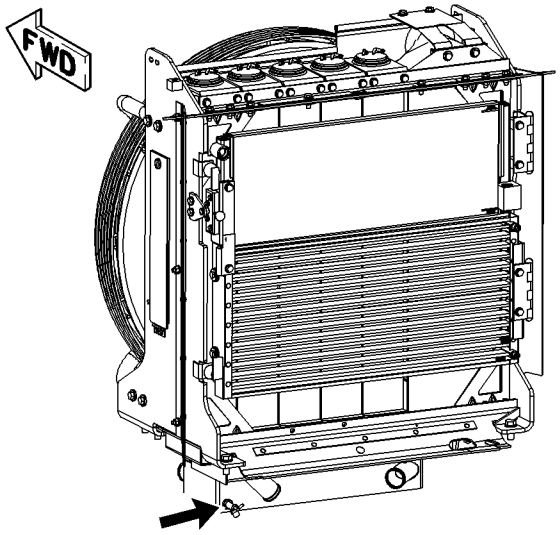


Illustration 159 g00753215

2. Open the drain valve on the bottom of the radiator. The drain valve can be accessed from the left side of the machine. Allow the coolant to drain into a suitable container.

3. Flush the cooling system with clean water until the draining water is clean. Close the drain valve.

4. Replace the water temperature regulator.

   Reference: Refer to Operation and Maintenance Manual, “Cooling System Water Temperature Regulator - Replace” for the correct procedure.

5. Add the Extended Life Coolant.

   Reference: Refer to Operation and Maintenance Manual, “Capacities (Refill)” for the refill capacity of the cooling system.

6. Start the engine. Run the engine without the cooling system pressure cap until the water temperature regulator opens and the coolant level stabilizes.

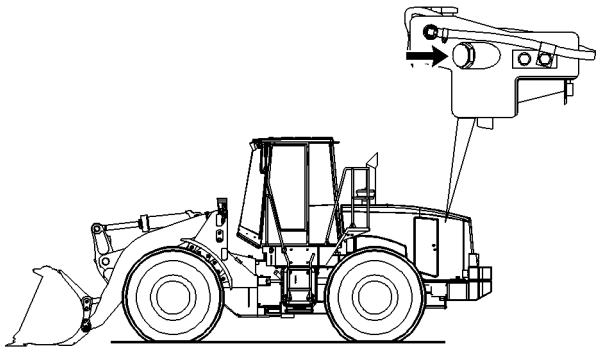


Illustration 160 g00753224

7. Maintain the coolant level in the sight gauge on the upper right side of the radiator.

8. Install the cooling system pressure cap. Stop the engine.

i01732076

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-544-NL

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Topping off or mixing Cat ELC with other products that do not meet Caterpillar EC-1 specifications reduces the effectiveness of the coolant and shortens coolant service life.

Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants. Use only Extender with Cat ELC.

Failure to follow these recommendations can result in shortened cooling system component life.

When a Caterpillar Extended Life Coolant (ELC) is used, an Extender must be added to the cooling system.

Use a 8T-5296 Coolant Conditioner Test Kit to check the concentration of the coolant.

Reference: For additional information about the addition of Extender, refer to Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

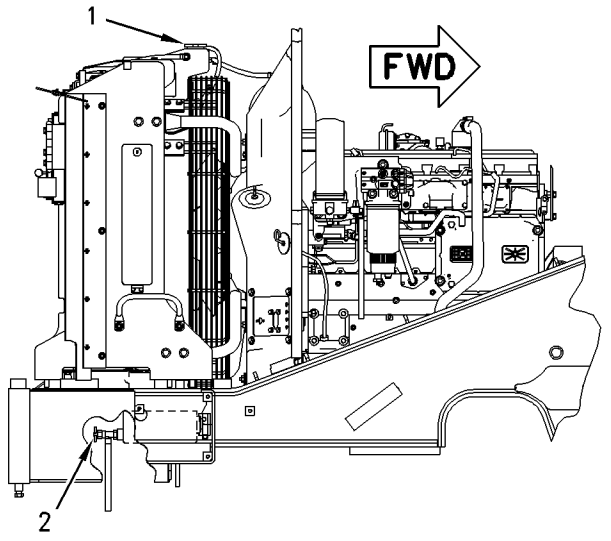


Illustration 161 g00764449

The cooling system pressure cap is located under the engine hood at the rear of the machine. Tilt the hood in order to access the cooling system pressure cap. The cap is located on the radiator tank on the left side of the machine.

1. Slowly loosen the cooling system pressure cap (1) in order to relieve any system pressure. Remove the cooling system pressure cap.
2. If necessary, drain enough coolant from the radiator in order to allow the addition of the Extender to the cooling system. The cooling system drain valve (2) is located on the lower left side of the radiator.
3. Add 1.5 L (1.6 qt) of Extender to the cooling system.

   Reference: Refer to Operation and Maintenance Manual, “Capacities (Refill) ” for the correct amount.
4. Check the coolant level.

   Reference: Refer to Operation and Maintenance Manual, “Cooling System Level - Check” for the correct procedure.
5. Install the cooling system pressure cap. Close the engine hood.

i01910924

Cooling System Coolant Level - Check

SMCS Code: 1350-535-FLV

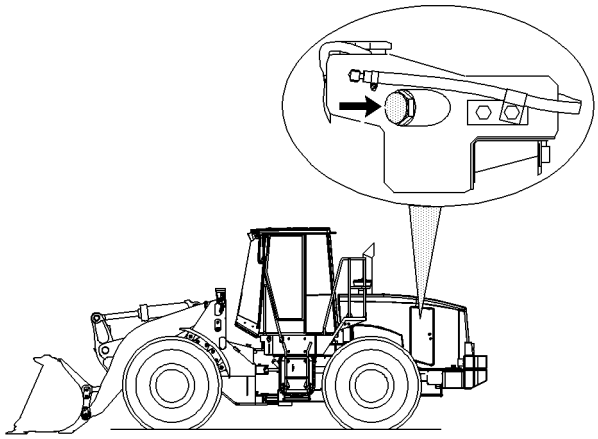


Illustration 162 g00753303

Open the service door on the left side of the machine. The coolant level sight gauge is located on the left side of the radiator.

Maintain the coolant level within the sight gauge. Add coolant, if necessary.

Note: If it is necessary to add coolant daily, inspect the cooling system for leaks.

i01910955

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 1350-008; 1395-008; 7542

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: Level 1 results may indicate a need for Level 2 Analysis.

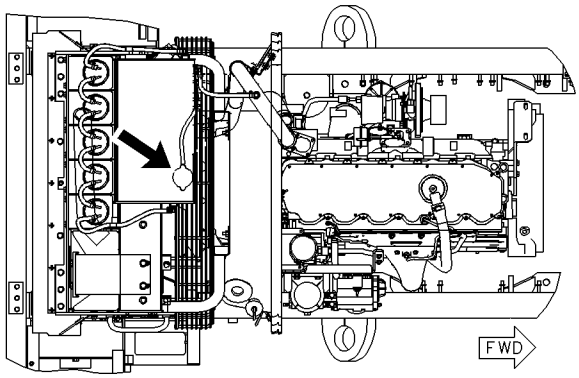


Illustration 163 g00767660

Obtain the sample of the coolant as close as possible to the recommended sampling interval. In order to receive the full effect of S·O·S analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent samplings that are evenly spaced. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Use the following guidelines for proper sampling of the coolant:

- Complete the information on the label for the sampling bottle before you begin to take the samples.
- Keep the unused sampling bottles stored in plastic bags.
- Obtain coolant samples directly from the coolant sample port. You should not obtain the samples from any other location.
- Keep the lids on empty sampling bottles until you are ready to collect the sample.
- Place the sample in the mailing tube immediately after obtaining the sample in order to avoid contamination.
- Never collect samples from expansion bottles.
- Never collect samples from the drain for a system.

Submit the sample for Level 1 analysis.

For additional information about coolant analysis, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01910979

Cooling System Coolant Sample (Level 2) - Obtain

SMCS Code: 1350-008; 1395-008; 7542

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

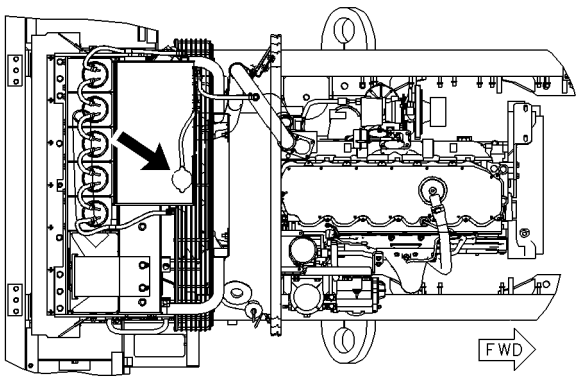


Illustration 164 g00767660

Obtain the sample of the coolant as close as possible to the recommended sampling interval. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Refer to Operation and Maintenance Manual, “Cooling System Coolant Sample (Level 1) - Obtain” for the guidelines for proper sampling of the coolant.

Submit the sample for Level 2 analysis.

Reference: For additional information about coolant analysis, refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01738747

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510; 1393-010

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE
Failure to replace the engine’s thermostat on a regularly scheduled basis could cause severe engine damage.

NOTICE
Caterpillar engines incorporate a shunt design cooling system and require operating the engine with a thermostat installed.

If the thermostat is installed wrong, it will cause the engine to overheat. Inspect gaskets before assembly and replace if worn or damaged.

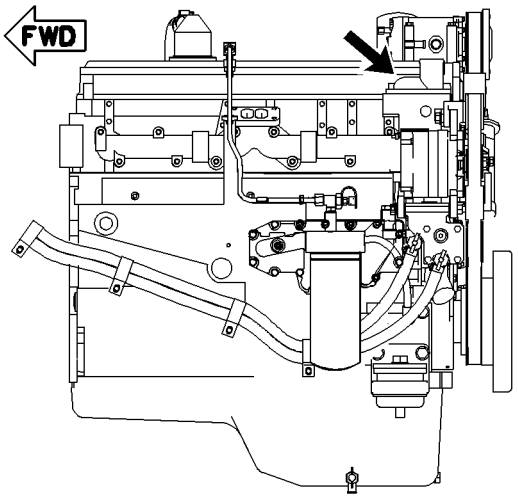


Illustration 165 g00890574

Replace the water temperature regulator in order to reduce the chance of problems with the cooling system. The water temperature regulator is located on the left side of the machine near the alternator.

Replace the water temperature regulator and replace the seals while the cooling system is completely drained or while the coolant is drained to a level that is below the water temperature regulator housing.

Note: If you are only replacing the water temperature regulator, drain the coolant to a level that is below the water temperature regulator housing.

Reference: Refer to Disassembly and Assembly, SENR3611, “3126 Engines for Caterpillar Built Machines” for the correct procedure for replacing the water temperature regulator.

i02441594

Differential and Final Drive Oil - Change

SMCS Code: 3278-044; 4011-044

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

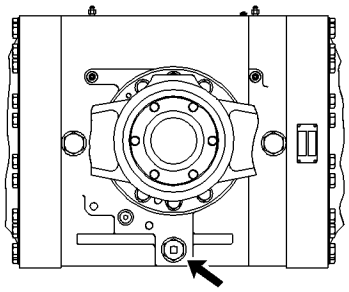


Illustration 166 g00989676
Machine without axle oil cooler

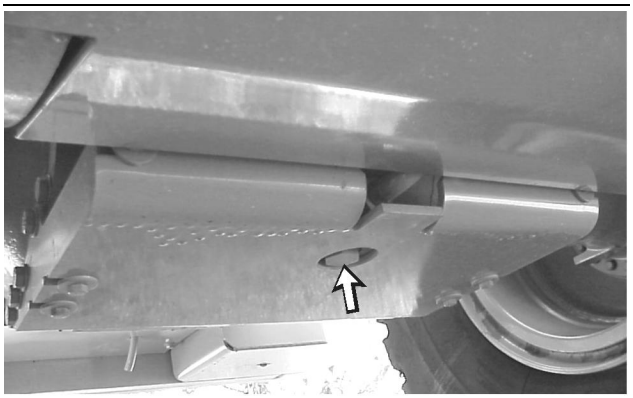


Illustration 167 g00630605
Machine with axle oil cooler

Note: The axle housings are equipped with ecology drain valves.

1. Remove the drain plugs. Attach a hose to a suitable drain adapter. Install a drain adapter into each drain valve. Allow the oil to drain into a suitable container.
2. Remove the drain adapters from the drain valves.
3. Clean the drain plugs and install the drain plugs.

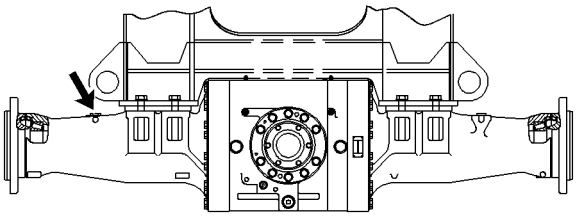


Illustration 168 g00989672
Dipstick/fill plug for the front axle

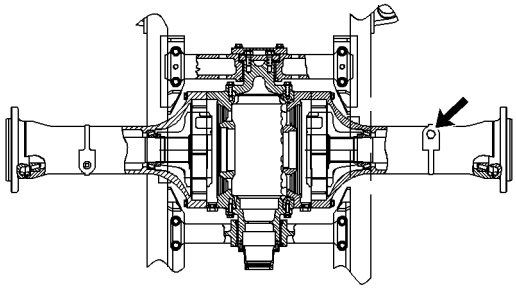


Illustration 169 g00989674
Dipstick/fill plug for the rear axle

4. Wipe off the dipstick/fill plugs and the surfaces around the dipstick/fill plugs.
5. Remove the dipstick/fill plugs. Add 0.5 L (0.5 qt) of 1U-9891 Hydraulic Oil Additive to each axle. Fill the axles with oil.

   Reference: Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the type of lubricant and for the refill capacity.
6. Clean the dipstick/fill plugs and install the dipstick/fill plugs.
7. Run the machine on level ground for a few minutes in order to equalize the oil level in the axle. Check the oil level in the axle.

Reference: Refer to Operation and Maintenance Manual, “Differential and Final Drive Oil Level - Check” for the correct procedure.

i01902117

Differential and Final Drive Oil Level - Check

SMCS Code: 3278-535-FLV; 4011-535-FLV

Note: Before you measure the oil level, operate the machine for a few minutes in order to equalize the oil level.

1. Park the machine on level ground. Lower the bucket and apply slight downward pressure. Engage the parking brake. Stop the engine.

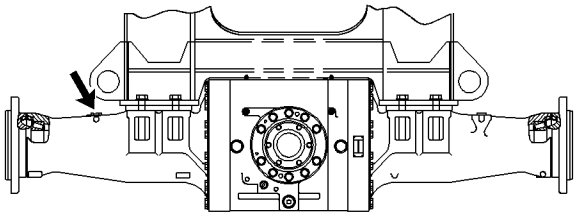


Illustration 170 g00989672

Dipstick/fill plug for the front axle

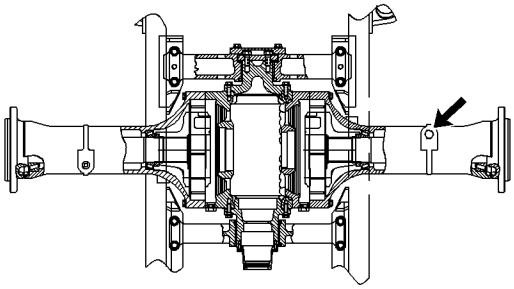


Illustration 171 g00989674

Dipstick/fill plug for the rear axle

2. Remove the dipstick/fill plug. Wipe off the level gauge with a clean cloth and reinsert the plug. This will ensure a more accurate measurement of the oil level.

Note: Make sure that the plug is installed completely before you check the oil level. If the plug is not installed completely, an incorrect oil level reading can occur.

3. Remove the dipstick/fill plug again and check the oil level. Maintain the oil level between the ADD mark and the FULL mark. Add oil, if necessary.

   Reference: Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the type of lubricant and for the refill capacity.

4. Clean the plug and install the plug.

5. Repeat Step 2 through Step 4 for the rear axle.

i01911031

Differential and Final Drive Oil Sample - Obtain

SMCS Code: 3278-008; 4011-008; 4070-008; 7542

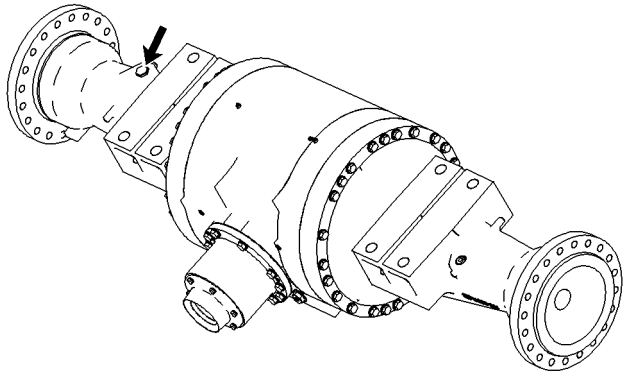


Illustration 172 g00667052

Front axle

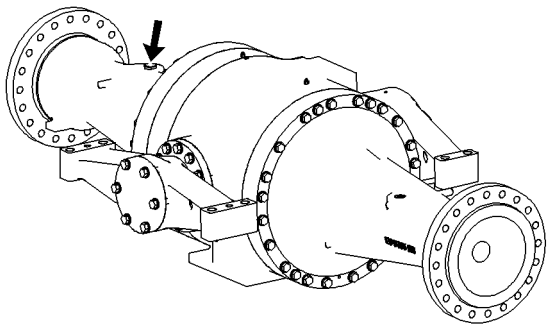


Illustration 173 g00667053

The axles are not equipped with sampling valves. Obtaining a sample of the differential and final drive oil will require a vacuum pump or an equivalent. Withdraw the fluid through the filler opening on the right side of each axle.

Reference: Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for more information about obtaining an fluid sample.

i01462847

Drive Shaft Spline (Center) - Lubricate

SMCS Code: 3253-086-SN

Note: For better access to the fitting, articulate the machine to the right or to the left. Since the steering frame lock cannot be connected in this case, remove the engine start switch key and turn the battery disconnect switch to the OFF position.

Wipe off the fitting before you apply any lubricant.

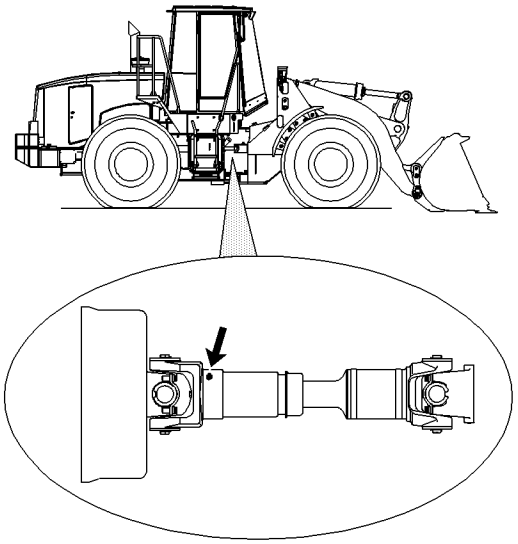


Illustration 174 g00764632

Apply lubricant through the fitting for the center drive shaft spline.

i02407816

Drive Shaft Support Bearing - Lubricate

SMCS Code: 3267-086-BD

⚠ WARNING

Crushing Hazard. Insure that the machine ignition switch is in the OFF position and that the parking brake is engaged before entering the articulation area. Failure to do so could result in serious injury or death.

Wipe off the fitting before any lubricant is applied.

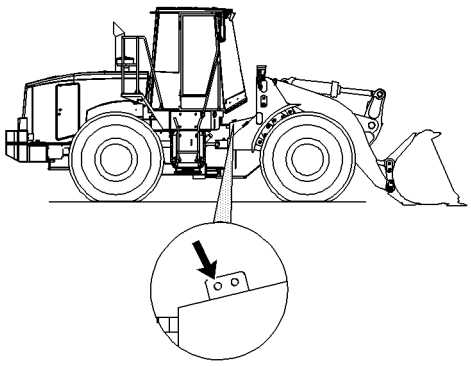


Illustration 175 g00764668

Apply lubricant through the remote fitting on the right side of the machine. Use the fitting that is toward the rear of the machine.

i02067023

Drive Shaft Universal Joints - Lubricate

SMCS Code: 3251-086

Note: Check for sealed universal joints that do not require lubrication.

Wipe off all fittings before any lubricant is applied.

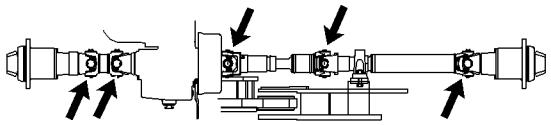


Illustration 176 g00291135

Apply lubricant through one fitting on each universal joint. There are a total of five fittings.

i01902270

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070-PY; 1054-510-PY

⚠ WARNING

To avoid personal injury, always wear eye and face protection when using pressurized air.

NOTICE
Caterpillar recommends certified air filter cleaning services that are available at Caterpillar dealers. The Caterpillar cleaning process uses proven procedures to assure consistent quality and sufficient filter life.

Observe the following guidelines if you attempt to clean the filter element:

Do not tap or strike the filter element in order to remove dust.

Do not wash the filter element.

Use low pressure compressed air in order to remove the dust from the filter element. Air pressure must not exceed 207 kPa (30 psi). Direct the air flow up the pleats and down the pleats from the inside of the filter element. Take extreme care in order to avoid damage to the pleats.

Do not use air filters with damaged pleats, gaskets, or seals. Dirt entering the engine will cause damage to engine components.

NOTICE
Service the air filter only with the engine stopped. Engine damage could result.

1. Open the engine compartment. The air filter is located on the right side of the machine.

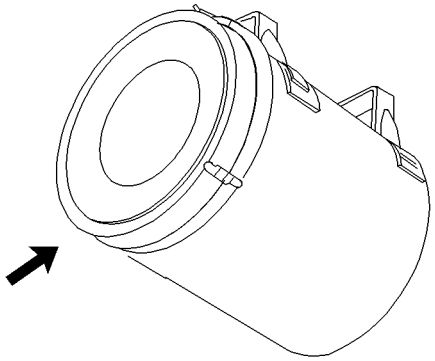


Illustration 177 g00845360

2. Loosen the cover latches and remove the air cleaner cover.

Note: The latches for the air cleaner housing may snap open when you release the latches.

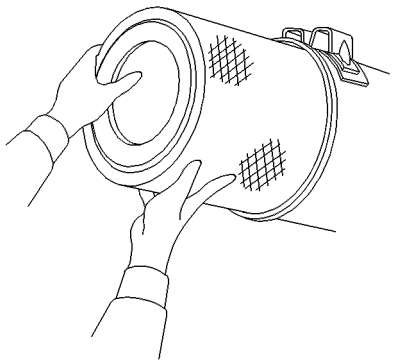


Illustration 178 g00101415

3. Remove the primary filter element from the air cleaner housing. In order to remove the engine air filter primary element, pull the element outward. While you pull the element outward, rock the element.

   Use Steps 4 **through** 6 **in order to clean the primary element:**

4. Inspect the primary element. If the pleats, the gaskets, or the seals are damaged, discard the element. Replace a damaged primary element with a clean primary element.

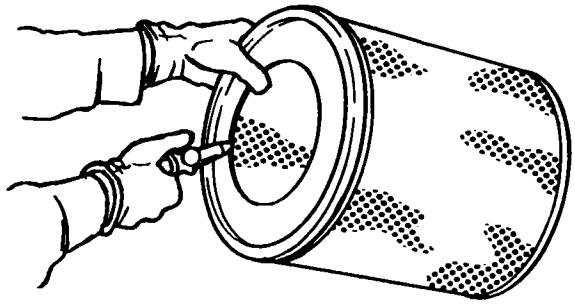


Illustration 179 g00328468

5. If the primary element is not damaged, clean the primary element.

   Pressurized air can be used to clean a primary element that has not been cleaned more than two times. Use filtered, dry air at a maximum pressure of 207 kPa (30 psi).

Note: Pressurized air will not remove deposits of carbon and oil.

6. When you clean the primary element, always begin in the inside of the element (clean side). This will force dirt particles toward the outside of the element (dirty side).

   Direct the air along the length (inside) of the filter. This will help prevent damage to the paper pleats.

Note: Do not aim the stream of air directly at the primary element. Dirt could be forced further into the pleats.

Use Steps 7 **through** 10 **in order to inspect the primary element:**

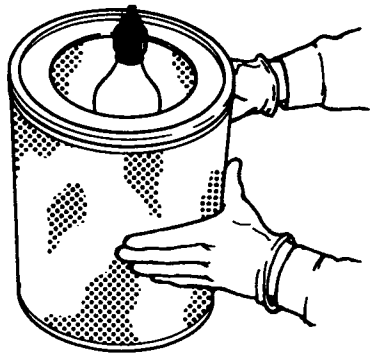


Illustration 180 g00328470

7. Place a light bulb inside the filter element. Use a 60 watt blue light in a dark room or in a similar facility. Inspect the primary element for light that may show through the filter material.

8. Inspect the primary element while you rotate the element. Inspect the primary element for tears and/or holes. Do not use a primary element that has any tears and/or holes in the filter material. Do not use a primary element with damaged pleats, gaskets, or seals.

9. If it is necessary, compare the primary element to a new primary element. Use a new primary element that has the same part number. This may be necessary in order to confirm the results of the inspection.

10. Discard a damaged primary element.

Use Steps 11 **through** 13 **to install a clean primary element:**

NOTICE
Do not use a filter if the pleats, the gaskets or the seals are damaged.

11. Install a clean primary filter element over the engine air filter secondary element. Apply firm pressure to the end of the primary element as you gently rock the filter element. This seats the primary element.

12. Clean the cover for the air cleaner housing. Align the slot on the cover with the pin on the air cleaner housing. Install the cover.

13. Close the engine.

i01693619

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510-SE

NOTICE
Service the air filter only with the engine stopped. Engine damage could result.

NOTICE
Always replace the secondary element. Do not attempt to reuse it by cleaning. Engine damage could result.

Note: Replace the secondary element when you service the primary element for the third time. If a clean primary element has been installed and a warning for the air filter still occurs, replace the secondary element. Also if the exhaust smoke remains black and a clean primary element has been installed, replace the secondary element.

1. Remove the primary element.

   Reference: Refer to Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace” for the correct procedure.

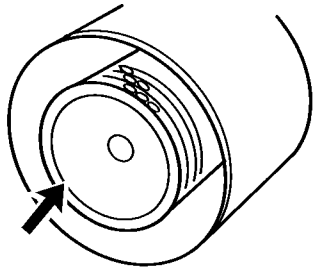


Illustration 181 g00864077

2. Remove the secondary element.

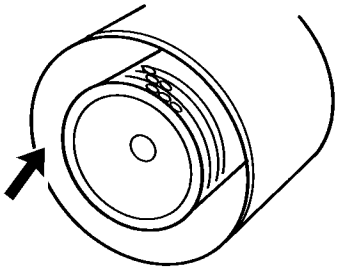


Illustration 182 g00864079

3. Cover the air inlet opening. Clean the inside of the air cleaner housing.
4. Inspect the gasket between the air inlet pipe and the air cleaner housing. Replace the gasket if the gasket is damaged.
5. Uncover the air inlet opening. Install a new secondary element.
6. Install a clean primary element and the cover for the air cleaner housing.
7. Close the access door.
8. Repeat the procedure for the other air cleaner.

i01438467

Engine Air Precleaner - Clean

SMCS Code: 1055-070

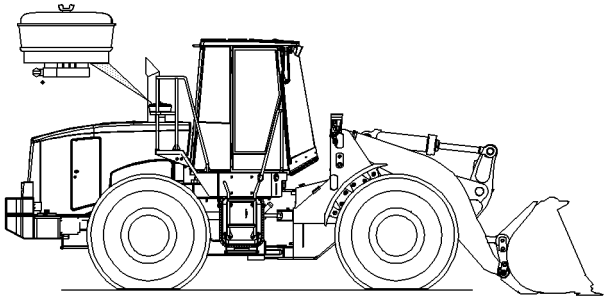


Illustration 183 g00764735

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

1. Remove the precleaner.
2. Inspect the air inlet screen for dirt and for trash. Remove the screen. Clean the screen if the screen is dirty.
3. Inspect the precleaner tube openings. Remove dirt and debris.
4. Clean the precleaner with compressed air or wash the precleaner in warm water. Dry all the parts.
5. Install the precleaner screen.

i01902420

Engine Auxiliary Air Filter - Replace (If Equipped)

SMCS Code: 1054-070-AX; 1054-510-AX

Some machines may be equipped with an auxiliary air filter that is located behind the main air filter housing. Use the following procedure to replace the auxiliary air filter.

1. Remove four bolts and the access plate on the engine hood.

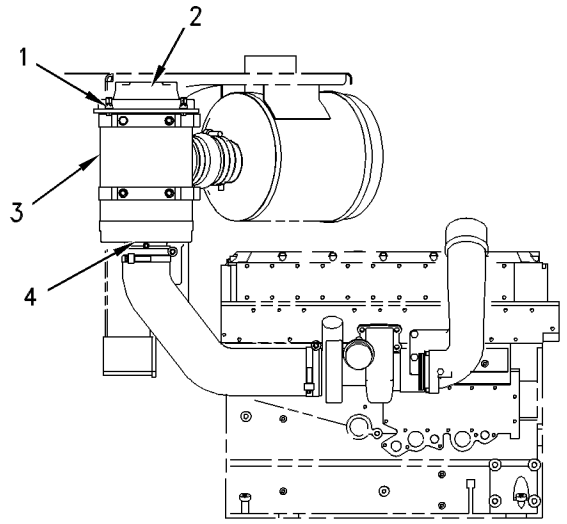


Illustration 184 g00351832

Side view of the auxiliary air filter housing

2. Remove four nuts (1) and access cover (2) from the top of auxiliary air filter housing (3).

3. Remove the auxiliary air filter element.

4. Cover air outlet (4). Clean the inside of the auxiliary air filter housing.

5. Uncover the air outlet. Install a new auxiliary air filter element.

6. Install access cover (2) and four nuts (1).

7. Install the access plate on the engine hood and secure the access plate with the four bolts.

i01438568

Engine Crankcase Breather - Clean

SMCS Code: 1317-070

1. Open the engine hood. The engine crankcase breather is located on the right side of the machine.

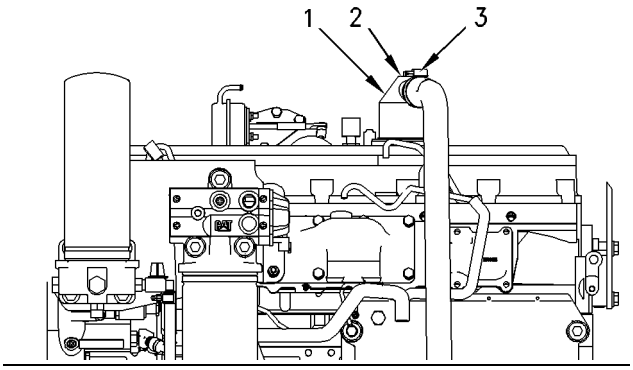


Illustration 185 g00753635

2. The engine crankcase breather is located near the air cleaner housing. Loosen hose clamp (3) and remove the outlet hose from breather (1).

3. Remove bolt (2) and the breather.

4. Check the condition of the seal on the breather cover. Replace the seal if the seal is damaged.

5. Wash the breather cover and the element in a clean, nonflammable solvent.

6. Shake the element dry or use pressure air to dry the element.

7. Inspect the outlet hose for damage. Replace the hose, if necessary.

8. Install breather (1) and bolt (2).

9. Install the outlet hose and hose clamp (3).

10. Close the engine hood.

i02093708

Engine Oil (High Speed) and Oil Filter - Change

SMCS Code: 1318-510-HZ

Selection of the Oil Change Interval

NOTICE
This machine is equipped with an engine that meets EPA Tier 2, Euro Stage II, or MOC Step 2 emission regulations. A 500 hour engine oil change interval is available, provided that operating conditions and recommended multigrade oil types are met. When these requirements are not met, shorten the oil change interval to 250 hours, or use an S·O·S oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

Caterpillar oil filters are recommended.

Recommended multigrade oil types are listed in the tables. Do not use single grade oils.

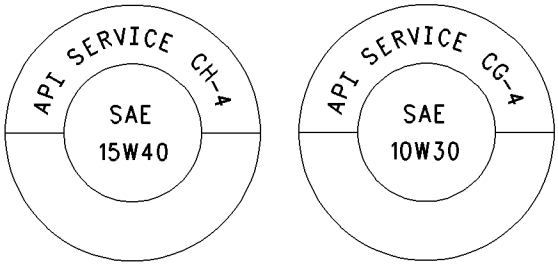


Illustration 186 g00753767

API Trademark

Commercial oils that are licensed by the American Petroleum Institute (API) bear this trademark. Commercial oils that do not bear this trademark are not licensed and these oils are not recommended.

Abnormally harsh operating cycles or harsh environments can shorten the service life of the engine oil. Arctic temperatures, corrosive environments, or extremely dusty conditions may require a reduction in engine oil change intervals. Poor maintenance of air filters or of fuel filters requires reduced oil change intervals.

Reference: For more information, refer to Operation and Maintenance Manual, SEBU5898, “Cold Weather Recommendations” or see your Caterpillar dealer.

Table 17

950G Series II Wheel Loader Engine Oil Change Interval[1]				
Multigrade Oil Type	Operating Conditions			
	Normal[2]	High Load Factor[3] above 23 L (6 US gal) per hr of fuel	Severe	
			Fuel Sulfur from 0.3% to 0.5% [4]	Altitude above 1830 m (6000 ft)
Cat DEO Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 11.0 minimum TBN[4] Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 TBN[4] below 11.0	500 hr	500 hr	250 hr[5]	250 hr[6]
API CG-4	250 hr[5]	250 hr[5]	250 hr[5]	250 hr[6]
API CF-4	250 hr[6]	250 hr[6]	250 hr[6]	250 hr[6]

(1) The traditional oil change interval for engines is 250 hours. The standard oil change interval in this machine is 500 hours, if the operating conditions and recommended oil types that are listed in this table are met. Improvements in the engine allow this engine oil change interval. This new standard interval is not permitted for other machines. Refer to the applicable Operation and Maintenance Manuals for the other machines.

(2) Normal conditions include these factors: Fuel sulfur below 0.3%, altitude below 1830 m (6000 ft), and good air filter and fuel filter maintenance. Normal conditions do not include high load factor, harsh operating cycles, or harsh environments.

(3) High load factors can shorten the service life of your engine oil. Continuous heavy load cycles and very little idle time result in increased fuel consumption and oil contamination. These factors deplete the oil additives more rapidly. If the average fuel consumption exceeds 23 L (6 US gal) per hour for the 950G Series II Wheel Loader, follow the “High Load Factor” recommendations in Table 17. To determine average fuel consumption, measure average fuel consumption for a period of 50 to 100 hours. If the application of the machine is changed, the average fuel consumption may change.

(4) For sulfur content above 0.5%, refer to Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Total Base Number (TBN) and Fuel Sulfur Levels for Direct Injection (DI) Diesel Engines”.

(5) In order to verify an oil change interval of 500 hours, refer to “Program A” below.

(6) Use “Program B” below to determine an appropriate interval.

Table 18

962G Series II Wheel Loader IT62G Series II Integrated Toolcarrier Engine Oil Change Interval[1]				
Multigrade Oil Type	Operating Conditions			
	Normal[2]	High Load Factor[3] above 25 L (6.5 US gal) per hr of fuel	Severe	
			Fuel Sulfur from 0.3% to 0.5% [4]	Altitude above 1830 m (6000 ft)
Cat DEO Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 11.0 minimum TBN[4] Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 TBN[4] below 11.0	500 hr	500 hr	250 hr[5]	250 hr[6]
API CG-4	250 hr[5]	250 hr[5]	250 hr[5]	250 hr[6]
API CF-4	250 hr[6]	250 hr[6]	250 hr[6]	250 hr[6]

(1) The traditional oil change interval for engines is 250 hours. The standard oil change interval in this machine is 500 hours, if the operating conditions and recommended oil types that are listed in this table are met. Improvements in the engine allow this engine oil change interval. This new standard interval is not permitted for other machines. Refer to the applicable Operation and Maintenance Manuals for the other machines.

(2) Normal conditions include these factors: Fuel sulfur below 0.3%, altitude below 1830 m (6000 ft), and good air filter and fuel filter maintenance. Normal conditions do not include high load factor, harsh operating cycles, or harsh environments.

(3) High load factors can shorten the service life of your engine oil. Continuous heavy load cycles and very little idle time result in increased fuel consumption and oil contamination. These factors deplete the oil additives more rapidly. If the average fuel consumption exceeds 25 L (6.5 US gal) per hour for the 962G Series II Wheel Loader, follow the “High Load Factor” recommendations in Table 18. To determine average fuel consumption, measure average fuel consumption for a period of 50 to 100 hours. If the application of the machine is changed, the average fuel consumption may change.

(4) For sulfur content above 0.5%, refer to Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Total Base Number (TBN) and Fuel Sulfur Levels for Direct Injection (DI) Diesel Engines”.

(5) In order to verify an oil change interval of 500 hours, refer to “Program A” below.

(6) Use “Program B” below to determine an appropriate interval.

Adjustment of the Oil Change Interval

Note: Your Caterpillar dealer has additional information on these programs.

Program A

Verification for an Oil Change Interval of 500 Hours

This program consists of three oil change intervals of 500 hours. Oil sampling and analysis is done at 250 hours and 500 hours for each of the three intervals for a total of six oil samples. The analysis includes oil viscosity and infrared (IR) analysis of the oil. If all of the results are satisfactory, the 500 hour oil change interval is acceptable for the machine in that application. Repeat Program A if you change the application of the machine.

If a sample does not pass the oil analysis, take one of these actions:

- Shorten the oil change interval to 250 hours.
- Proceed to Program B.
- Change to a preferred oil type.

Program B

Optimizing Oil Change Intervals

Begin with a 250 hour oil change interval. The oil change intervals are adjusted by increments. Each interval is adjusted an additional 50 hours. Periodic oil sampling and analysis is done during each interval. The analysis includes oil viscosity and infrared (IR) analysis of the oil. Repeat Program B if you change the application of the machine.

If an oil sample does not pass the analysis, shorten the oil change interval, or change to a preferred multigrade oil type in the listing above.

References

Reference: Special Publication, PEDP7035, “Optimizing Oil Change Intervals”

Reference: Special Publication, PEDP7036, “S·O·S Fluid Analysis”

Reference: Special Publication, PEDP7076, “Understanding the S·O·S Oil Analysis Tests”

Procedure for Changing the Engine Oil and Filter

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Your machine may be equipped with a high speed arrangement for changing the engine oil. The high speed arrangement allows service personnel to change the oil from the engine access door on the right side of the machine. The high speed arrangement allows the oil to be changed faster than conventional methods.

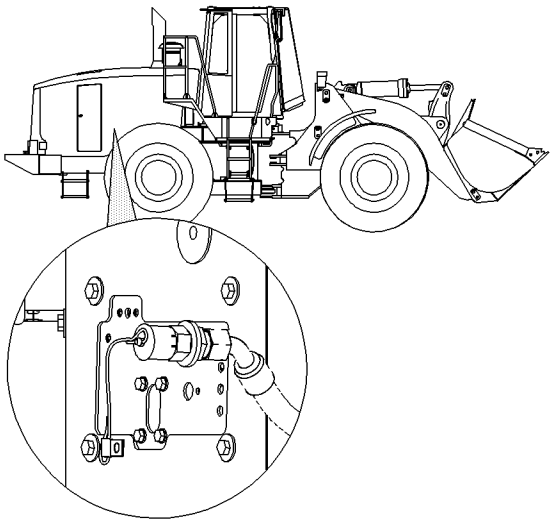


Illustration 187 g00812715

1. Open the service door that is located on the right side of the machine.
2. Remove the cap that protects the male coupler. Connect an oil pump to the fitting. The fitting on the machine is a male coupler.
3. Turn on the oil pump and withdraw the engine oil from the engine oil pan.
4. Open the engine hood.

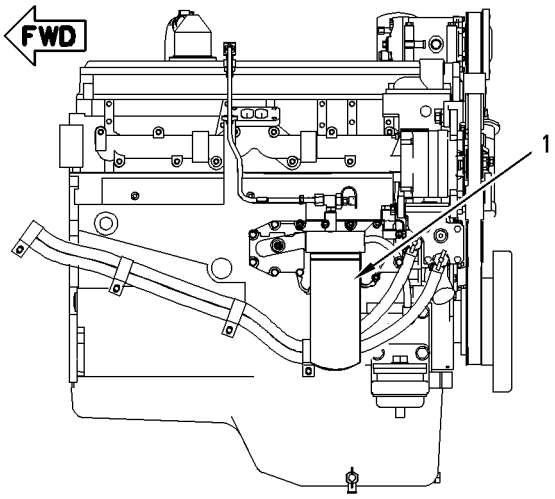


Illustration 188 g00890554

The oil filter is located on the left side of the machine.

5. Use a strap type wrench to remove filter element (1). Inspect the filter.

   Reference: For more information, refer to Operation and Maintenance Manual, “Oil Filter - Inspect”.

6. Clean the filter mounting base with a clean cloth. Make sure that the used filter gasket has been completely removed.

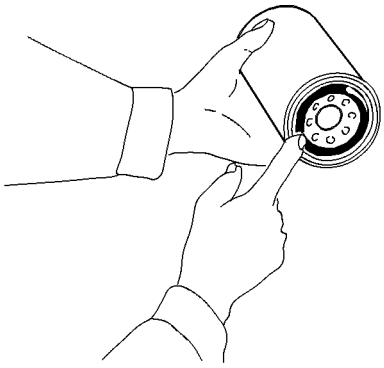


Illustration 189 g00101318

7. Apply a thin film of clean engine oil to the sealing surface of the new filter element.
8. Install the engine oil filter element (1) hand tight until the seal of the engine oil filter element (1) contacts the oil filter base.

Note: Note the position of the index marks on the oil filter element (1) in relation to a fixed point on the filter base.

9. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide.

10. Connect an oil pump to the male coupler for the high speed arrangement. Fill the crankcase with new oil.

    Reference: Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the correct type of oil and for the correct amount of oil.

11. Clean the end of the male coupler. Clean the cap that covers the male coupler and install the cap.

12. Start the engine and allow the oil to warm. Check the machine for oil leaks.

13. Check the engine oil level.

    Reference: Refer to Operation and Maintenance Manual, “Engine Oil Level - Check” for the correct procedure.

14. Stop the engine. Close the engine access door and the engine hood.

i02097831

Engine Oil Level - Check

SMCS Code: 1000-535-FLV

NOTICE
Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

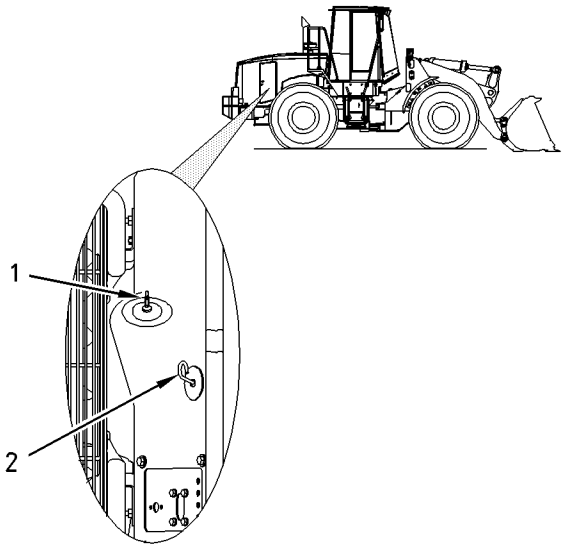


Illustration 190 g00753678

1. Stop the engine. Open the access door on the right side of the machine.

2. Remove dipstick (2) and wipe off the dipstick with a clean cloth. Then, reinsert the dipstick and remove the dipstick again. This will give a more accurate measurement of the oil level.

3. Maintain the engine oil between the FULL mark and the ADD mark on dipstick (2). If necessary, remove filler cap (1) and add oil.

4. Close the engine access door.

i01911173

Engine Oil Sample - Obtain

SMCS Code: 1348-008; 7542

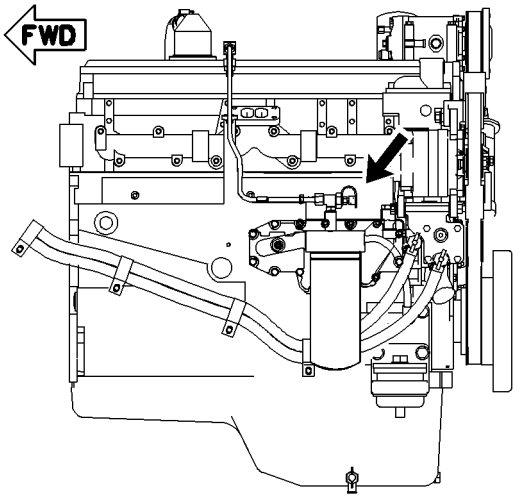


Illustration 191 g00890510

Obtain a sample of the engine oil from the engine oil sampling valve. The sampling valve is located in the engine compartment on the left side of the machine. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the engine oil.

i02093707

Engine Oil and Filter - Change

SMCS Code: 1318-510

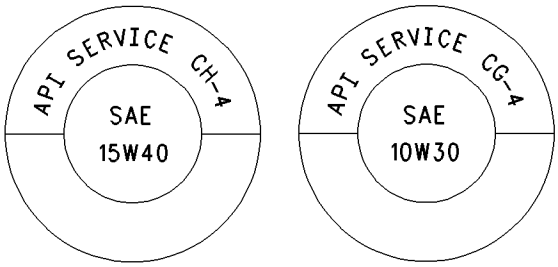
Selection of the Oil Change Interval

NOTICE
This machine is equipped with an engine that meets EPA Tier 2, Euro Stage II, or MOC Step 2 emission regulations. A 500 hour engine oil change interval is available, provided that operating conditions and recommended multigrade oil types are met. When these requirements are not met, shorten the oil change interval to 250 hours, or use an S·O·S oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

Caterpillar oil filters are recommended.

Recommended multigrade oil types are listed in the tables. Do not use single grade oils.



g00753767

Illustration 192

API Trademark

Commercial oils that are licensed by the American Petroleum Institute (API) bear this trademark. Commercial oils that do not bear this trademark are not licensed and these oils are not recommended. Oils that are not listed in the tables are not recommended.

Abnormally harsh operating cycles or harsh environments can shorten the service life of the engine oil. Arctic temperatures, corrosive environments, or extremely dusty conditions may require a reduction in engine oil change intervals. Poor maintenance of air filters or of fuel filters requires reduced oil change intervals.

Reference: Refer to Operation and Maintenance Manual, SEBU5898, “Cold Weather Recommendations” or see your Caterpillar dealer for more information.

Table 19

950G Series II Wheel Loader Engine Oil Change Interval[1]				
	Operating Conditions			
			Severe	
Multigrade Oil Type	Normal[2]	High Load Factor[3] above 23 L (6 US gal) per hr of fuel	Fuel Sulfur from 0.3% to 0.5% [4]	Altitude above 1830 m (6000 ft)
Cat DEO Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 11.0 minimum TBN[4] Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 TBN[4] below 11.0	500 hr	500 hr	250 hr[5]	250 hr[6]
API CG-4	250 hr[5]	250 hr[5]	250 hr[5]	250 hr[6]
API CF-4	250 hr[6]	250 hr[6]	250 hr[6]	250 hr[6]

(1) The traditional oil change interval for engines is 250 hours. The standard oil change interval in this machine is 500 hours, if the operating conditions and recommended oil types that are listed in this table are met. Improvements in the engine allow this engine oil change interval. This new standard interval is not permitted for other machines. Refer to the applicable Operation and Maintenance Manuals for the other machines.

(2) Normal conditions include these factors: Fuel sulfur below 0.3%, altitude below 1830 m (6000 ft), and good air filter and fuel filter maintenance. Normal conditions do not include high load factor, harsh operating cycles, or harsh environments.

(3) High load factors can shorten the service life of your engine oil. Continuous heavy load cycles and very little idle time result in increased fuel consumption and oil contamination. These factors deplete the oil additives more rapidly. If the average fuel consumption exceeds 23 L (6 US gal) per hour for the 950G Series II Wheel Loader, follow the “High Load Factor” recommendations in Table 19. To determine average fuel consumption, measure average fuel consumption for a period of 50 to 100 hours. If the application of the machine is changed, the average fuel consumption may change.

(4) For sulfur content above 0.5%, refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Total Base Number (TBN) and Fuel Sulfur Levels for Direct Injection (DI) Diesel Engines”.

(5) In order to verify an oil change interval of 500 hours, refer to “Program A” below.

(6) Use “Program B” below to determine an appropriate interval.

Table 20

962G Series II Wheel Loader IT62G Series II Integrated Toolcarrier Engine Oil Change Interval[1]				
Multigrade Oil Type	Operating Conditions			
	Normal[2]	High Load Factor[3] above 25 L (6.5 US gal) per hr of fuel	Severe	
			Fuel Sulfur from 0.3% to 0.5% [4]	Altitude above 1830 m (6000 ft)
Cat DEO Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 11.0 minimum TBN[4] Preferred	500 hr	500 hr	500 hr	250 hr[6]
API CH-4 TBN[4] below 11.0	500 hr	500 hr	250 hr[5]	250 hr[6]
API CG-4	250 hr[5]	250 hr[5]	250 hr[5]	250 hr[6]
API CF-4	250 hr[6]	250 hr[6]	250 hr[6]	250 hr[6]

(1) The traditional oil change interval for engines is 250 hours. The standard oil change interval in this machine is 500 hours, if the operating conditions and recommended oil types that are listed in this table are met. Improvements in the engine allow this engine oil change interval. This new standard interval is not permitted for other machines. Refer to the applicable Operation and Maintenance Manuals for the other machines.

(2) Normal conditions include these factors: Fuel sulfur below 0.3%, altitude below 1830 m (6000 ft), and good air filter and fuel filter maintenance. Normal conditions do not include high load factor, harsh operating cycles, or harsh environments.

(3) High load factors can shorten the service life of your engine oil. Continuous heavy load cycles and very little idle time result in increased fuel consumption and oil contamination. These factors deplete the oil additives more rapidly. If the average fuel consumption exceeds 25 L (6.5 US gal) per hour for the 962G Series II Wheel Loader, follow the “High Load Factor” recommendations in Table 20. To determine average fuel consumption, measure average fuel consumption for a period of 50 to 100 hours. If the application of the machine is changed, the average fuel consumption may change.

(4) For sulfur content above 0.5%, refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Total Base Number (TBN) and Fuel Sulfur Levels for Direct Injection (DI) Diesel Engines”.

(5) In order to verify an oil change interval of 500 hours, refer to “Program A” below.

(6) Use “Program B” below to determine an appropriate interval.

Adjustment of the Oil Change Interval

Note: Your Caterpillar dealer has additional information on these programs.

Program A

Verification for an Oil Change Interval of 500 Hours

This program consists of three oil change intervals of 500 hours. Oil sampling and analysis is done at 250 hours and 500 hours for each of the three intervals for a total of six oil samples. The analysis includes oil viscosity and infrared (IR) analysis of the oil. If all of the results are satisfactory, the 500 hour oil change interval is acceptable for the machine in that application. Repeat Program A if you change the application of the machine.

If a sample does not pass the oil analysis, take one of these actions:

- Shorten the oil change interval to 250 hours.
- Proceed to Program B.
- Change to a preferred oil type in Table 20.

Program B

Optimizing Oil Change Intervals

Begin with a 250 hour oil change interval. The oil change intervals are adjusted by increments. Each interval is adjusted an additional 50 hours. Periodic oil sampling and analysis is done during each interval. The analysis includes oil viscosity and infrared (IR) analysis of the oil. Repeat Program B if you change the application of the machine.

If an oil sample does not pass the analysis, shorten the oil change interval, or change to a preferred multigrade oil type in the listing above.

References

Reference: Special Publication, PEDP7035, “Optimizing Oil Change Intervals”

Reference: Special Publication, PEDP7036, “S·O·S Fluid Analysis”

Reference: Special Publication, PEDP7076, “Understanding the S·O·S Oil Analysis Tests”

Procedure for Changing the Engine Oil

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Open the engine hood.

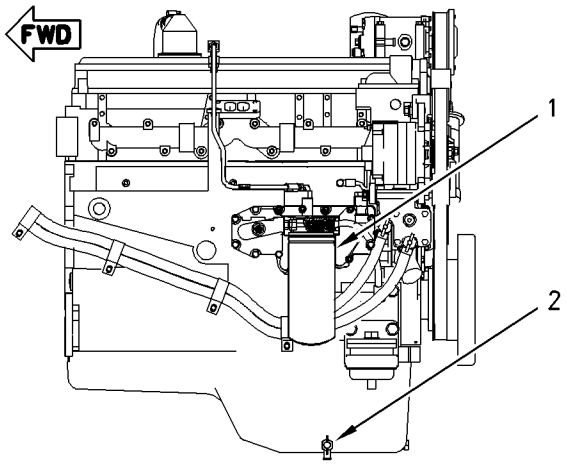


Illustration 193 g00888573

2. The crankcase drain valve (2) is located on the left side of the oil pan beneath the machine. Open the crankcase drain valve and allow the oil to drain into a suitable container. Close the drain valve.

3. Use a strap type wrench to remove oil filter (1) from the left side of the machine. Inspect the oil filter.

Reference: For more information, refer to Operation and Maintenance Manual, “Oil Filter - Inspect”.

4. Clean the filter housing base. Make sure that all of the used filter gasket is completely removed.

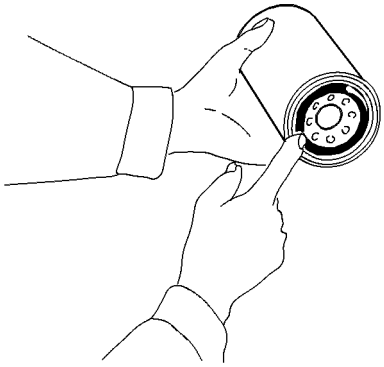


Illustration 194 g00101318

5. Apply a thin coat of clean engine oil to the sealing surface of the new filter element.

6. Install the engine oil filter element (1) hand tight until the seal of the engine oil filter element (1) contacts the oil filter base.

Note: Note the position of the index marks on the oil filter element (1) in relation to a fixed point on the filter base.

7. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide.

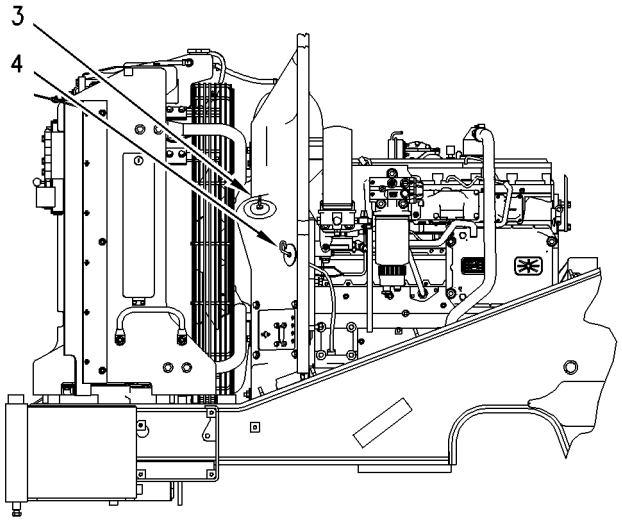


Illustration 195 g00888778

8. Remove filler cap (3). Fill the crankcase with new oil.

Reference: For the correct type of oil and for the correct amount of oil, refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

9. Clean the filler cap and install the filler cap.

10. Start the engine and allow the oil to warm. Check for leaks.

11. Check the oil level on dipstick (4).

    Reference: Refer to Operation and Maintenance Manual, “Engine Oil Level - Check” for the correct procedure.

12. Close the engine hood and stop the engine.

Procedure for Replacing the Centrifugal Oil Filter (962G Series II Wheel Loader only)

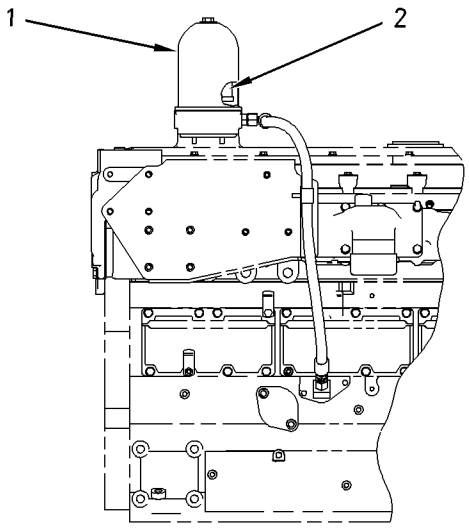


Illustration 196 g00888545

1. Open the engine hood in order to access the centrifugal oil filter (engine). The centrifugal oil filter is located on the top of the engine valve cover.

2. Remove filter housing (1) by loosening the nut on top of the housing.

Note: Oil from the centrifugal filter drains into the top of the valve cover into the engine.

3. Remove inner filter (2) from the center shaft by lifting the filter.

Note: The rotating filter traps contaminated particles inside the filter.

4. Clean the filter housing and clean the base. Make sure that all of the used filter gasket is removed from the housing and the base.

5. Install the new 202-9875 Centrifugal Filter Kit. The kit includes a new filter and a new gasket.

Note: Replace the centrifugal filter when the engine oil is changed.

6. Install filter housing (1). Install the nut on the top of the housing.

7. Tighten the nut to 20 ± 5 N·m (177 ± 44 lb in).

8. After changing the engine oil and the filter, start the engine and check for leaks.

9. Close the engine hood.

i01181536

Engine Valve Lash - Check

SMCS Code: 1105-535

For the correct procedure, refer to the appropriate Service Manual module for your machine’s engine or consult your Caterpillar dealer.

Note: A qualified mechanic should adjust the engine valve lash because special tools and training are required.

i00643879

Fuel Injection Timing - Check

SMCS Code: 1290-531-FT

Refer to the Service Manual for the complete adjustment procedure for the Fuel injector timing.

Note: The correct fuel timing specification is found on the Engine Information Plate. Fuel timing specifications may vary for different engine applications and/or for different power ratings.

A qualified mechanic should adjust the fuel injector timing because special tools and training are required.

i02235915

Fuel System - Prime

SMCS Code: 1250-548

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The fuel system needs to be primed due to the following circumstances:

- The primary fuel filter has been changed.
- The secondary fuel filter has been changed.
- The fuel injectors have been removed.
- The engine has run out of fuel.

Note: The volume of air in the water separator is small. Usually, it is not necessary to prime the fuel system if only the water separator element has been changed.

Your machine is equipped with an electric fuel priming pump. The priming pump is located on the right side of the engine above the primary fuel filter.

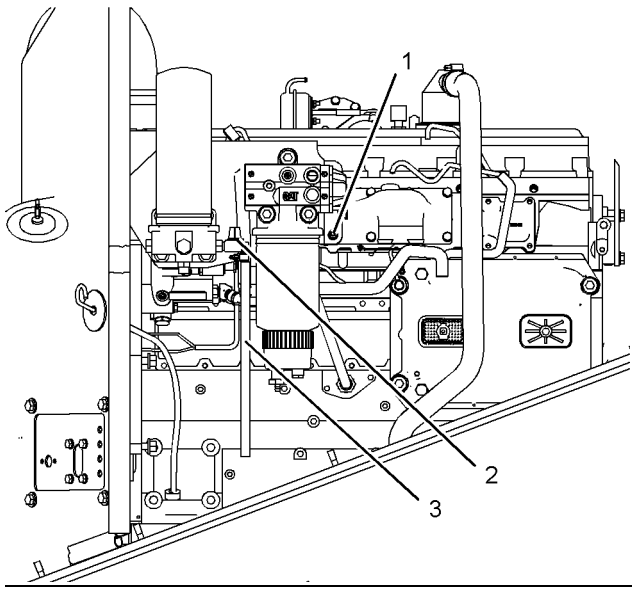


Illustration 197 g01127683

1. Open the engine hood in order to access the fuel priming pump. The fuel priming pump is located on the right side of the machine.
2. Place the drain hose (3) into a suitable container in order to catch the fuel. Open the drain valve (2). Move the toggle switch (1) in order to activate the priming pump.
3. Operate the priming pump until fuel comes out of the drain hose. Operate the priming pump until the fuel that flows from the drain hose has no air bubbles. Turn off the drain valve. Turn off the priming pump.

i01439459

Fuel System Primary Filter (Water Separator) - Drain

SMCS Code: 1263-543

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

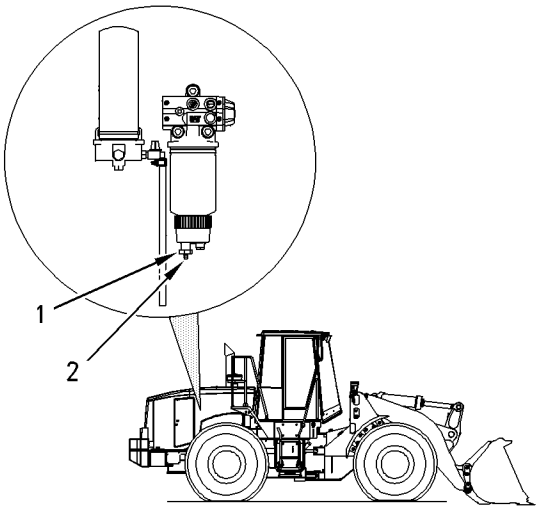


Illustration 198 g00753954

1. Open the engine hood. The water separator is located on the bottom of the primary fuel filter on the right side of the machine.

2. Attach a hose to the bottom of the drain valve (2). Open the drain valve (1) on the bottom of the water separator bowl. Allow the water and the fuel to drain into a suitable container.

3. Close the drain valve.

Note: The water separator is under suction during normal engine operation. Tighten the drain valve securely in order to prevent air leakage into the fuel system.

4. Close the engine hood.

i01439536

Fuel System Primary Filter (Water Separator) Element - Replace

SMCS Code: 1260-510; 1263-510-FQ

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts. Fuel system should be primed prior to starting the engine.

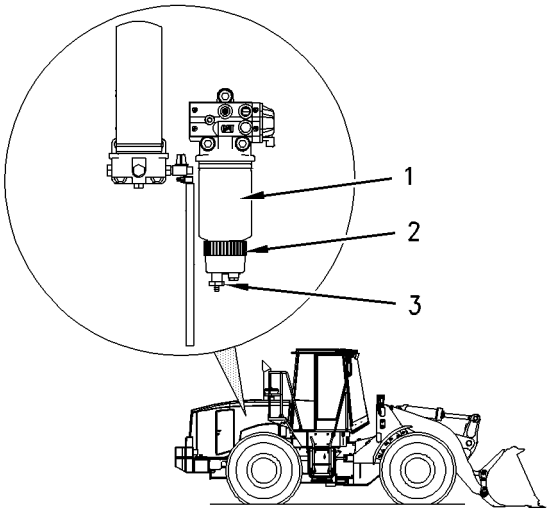


Illustration 199 g00765025

1. Open the engine hood. The primary fuel filter is located on the right side of the machine.

2. Open drain valve (3) on the bottom of water separator bowl (2). Allow the water and the fuel to drain into a suitable container.

3. Support the sediment bowl and rotate the retaining ring (2) counterclockwise. Remove the sediment bowl. Clean the water separator bowl and the O-ring groove.

Note: The water separator bowl is reusable. Do not discard the water separator bowl.

4. Remove the water separator element (1) from the mounting base by using a strap type wrench.

5. Inspect the O-ring seal on the water separator bowl. Replace the O-ring seal, if necessary.

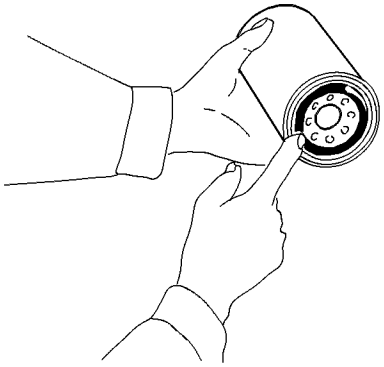


Illustration 200 g00101318

6. Lubricate the O-ring seal with clean diesel fuel. Place the O-ring seal in the water separator bowl.

7. Install the sediment bowl onto the new filter element. Do not use tools to tighten the filter element.

8. Install the new filter element hand tight until the seal contacts the mounting base. Then, tighten the filter element for an additional 3/4 of a turn.

9. Close drain valve (3).

Note: The water separator element is under suction during normal engine operation. Tighten the drain valve securely in order to prevent air leakage into the fuel system.

10. Prime the fuel system in order to fill the water separator element with fuel.

    Reference: Refer to Operation and Maintenance Manual, “Fuel System - Prime” for the correct procedure.

11. Close the engine hood.

i01439739

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510-SE

⚠ WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts.

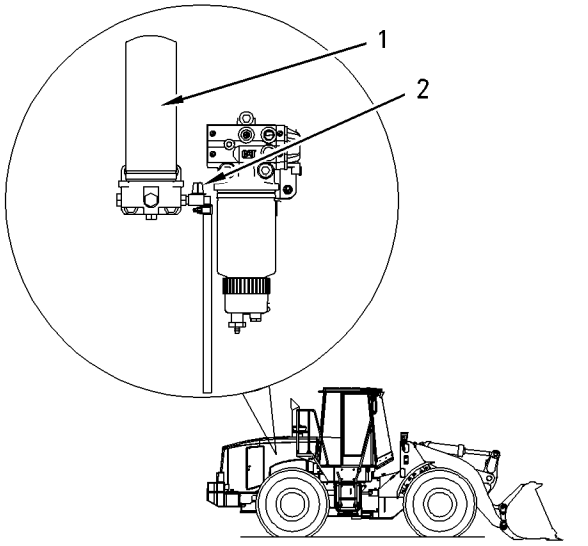


Illustration 201 g00754126

1. Open the engine hood. The secondary fuel filter (1) is located on the right side of the engine.
2. The secondary fuel filter is inverted. The filter must be properly drained before removal. Open the drain valve (2). Drain the fuel into a suitable container. The secondary fuel filter can now be removed.
3. Remove the filter by using a strap type wrench.
4. Inspect the fuel filter element for debris by cutting the filter open. Discard the used fuel filter element properly.
5. Clean the filter mounting base. Make sure that all of the used seal is removed from the filter mounting base.

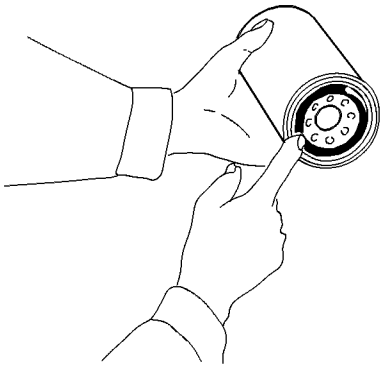


Illustration 202 g00101318

6. Apply a thin coat of clean diesel fuel to the sealing surface of the new fuel filter element.
7. Install the new fuel filter element by hand. When the seal contacts the filter base, tighten the fuel filter element by an additional 3/4 turn. This will tighten the fuel filter element sufficiently.
8. Prime the fuel system.

   Reference: Refer to Operation and Maintenance Manual, “Fuel System - Prime” for the correct procedure.
9. Close the engine hood.

i01464102

Fuel Tank Cap and Strainer - Clean

SMCS Code: 1273-070-Z2; 1273-070-STR

The fuel tank cap is located on the left side of the machine.

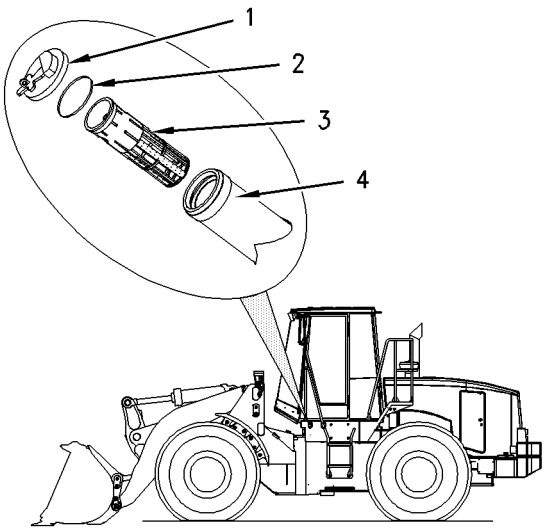


Illustration 203 g00765153

1. Remove fuel tank cap (1) and strainer (3) from fuel tank (4). Remove seal (2) from the cap.
2. Wash the strainer and the fuel tank cap in a clean, nonflammable solvent.
3. Install the strainer into the filler opening.
4. Inspect the seal for damage. Replace the seal, if necessary. Install the fuel tank cap.

i01464158

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

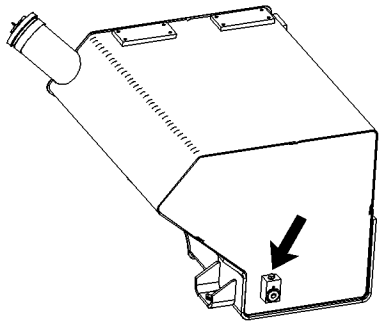


Illustration 204 g00765256

The drain valve is located under the fuel tank.

1. Open the drain valve and allow the water and sediment to drain into a suitable container.
2. Close the drain valve.

Note: If water and sediment are regularly found at weekly maintenance intervals, drain the sediment daily.

i02069536

Fuses - Replace

SMCS Code: 1417-510

NOTICE
Replace fuses with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical problem may exist. Contact your Caterpillar dealer.

Fuses – The fuses protect the electrical system from a circuit that has been overloaded. Change a fuse if the element separates. If the element of a new fuse separates, check the circuit. Repair the circuit, if necessary.

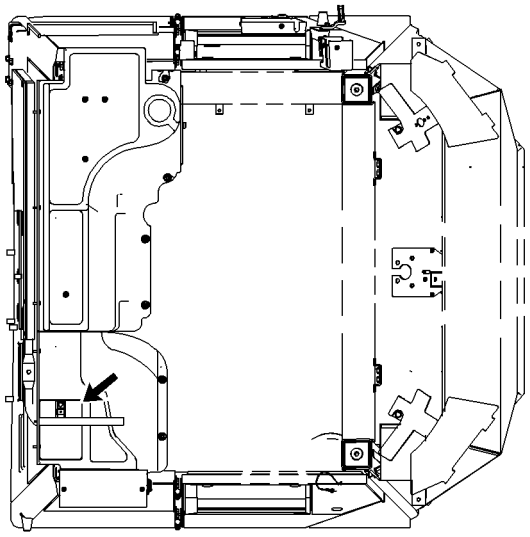


Illustration 205 g01000750

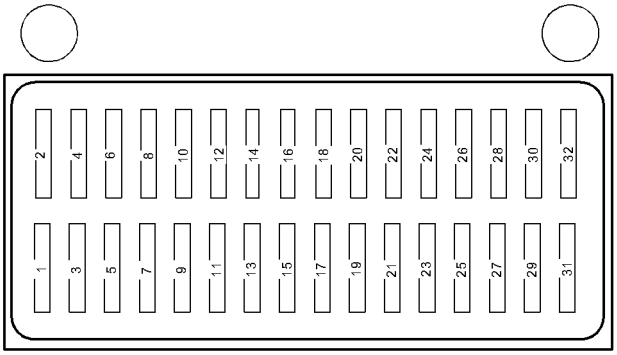


Illustration 206 g01060133

The fuses are located in the cab on the right side of the operator seat.

(1) Fourth Function or Grapple ..... 10 Amperes

(2) Neutralizer Override Switch ..... 10 Amperes

(3) Ether Injection ..... 10 Amperes

(4) Quick Coupler ..... 10 Amperes

(5) Rear Floodlights ..... 15 Amperes

(6) Axle Oil Coolers ..... 10 Amperes

(7) Secondary Steering ..... 10 Amperes

(8) Engine ECM ADEM III ..... 10 Amperes

(9) Front Floodlights ..... 15 Amperes

(10) Beacon ..... 10 Amperes

(11) Front and Rear Flasher Relays ..... 10 Amperes

(12) Product Link for the Machine Security System ..... 20 Amperes

(13) Lh Indicator Display and Rh Indicator Display ..... 10 Amperes

(14) Lift Position Sensor ..... 10 Amperes

(15) Transmission ECM and the Lh Brake Pedal Sensor ..... 10 Amperes

(16) Spare ..... 10 Amperes

(17) EMS, Quad Gauge, Tachometer, and Backlights ..... 10 Amperes

(18) Wiper and Washer for the Front and the Rear Windows ..... 10 Amperes

(19) Payload Control System ..... 15 Amperes

(20) Voltage Converter for Radio ..... 10 Amperes

(21) Center Indicator Display ..... 15 Amperes

(22) Spare ..... 10 Amperes

(23) Product Link ..... 10 Amperes

(24) Voltage Converter Memory ..... 20 Amperes

(25) ECAP ..... 10 Amperes

(26) Lh Tail Lamps and Clearance Lamps ..... 10 Amperes

(27) Hood Actuator ..... 10 Amperes

(28) Stop Lamp and Backup Alarm with Lamps ..... 10 Amperes

(29) Horn ..... 10 Amperes

(30) Voltage Converter Memory (Standard) ..... 10 Amperes

(31) Key Start Switch ..... 10 Amperes

(32) Dome Lamps ..... 10 Amperes

i02126498

Fuses - Replace (Machines that are Equipped with Electrohydraulic Controls and Conventional Steering)

SMCS Code: 1417-510

S/N: BAB1-Up

S/N: AYL1-Up

NOTICE
Replace fuses with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical problem may exist. Contact your Caterpillar dealer.

Note: Machines that are equipped with electrohydraulic controls and conventional steering will not have circuit breakers that are located by the fuse panel.

Fuses – The fuses protect the electrical system from a circuit that has been overloaded. Change a fuse if the element separates. If the element of a new fuse separates, check the circuit. Repair the circuit, if necessary.

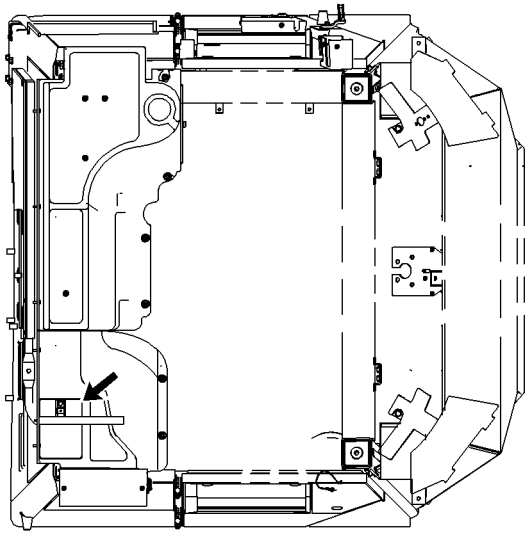


Illustration 207 g01000750

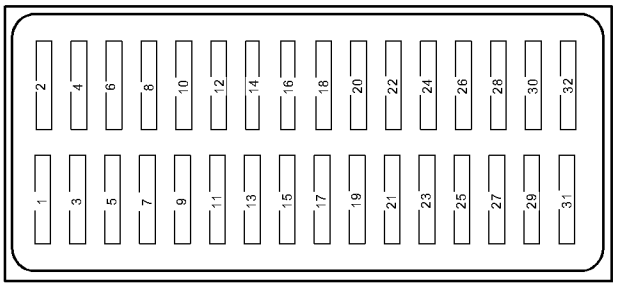


Illustration 208 g01078009

The fuses are located in the cab on the right side of the operator seat.

(1) Spare ..... 10 Amperes

(2) Neutralizer Override Switch ..... 10 Amperes

(3) HVAC Blower ..... 20 Amperes

(4) Quick Coupler and Alarm for Aggregate Autodig System ..... 10 Amperes

(5) Rear Floodlights ..... 15 Amperes

(6) Air Seat and Heated Seat ..... 15 Amperes

(7) Secondary Steering ..... 10 Amperes

(8) Engine ECM and Ether Injection ..... 10 Amperes

(9) Front Floodlights ..... 15 Amperes

(10) Beacon ..... 10 Amperes

(11) Front and Rear Flasher Relays ..... 10 Amperes

(12) Product Link for the Machine Security System ..... 10 Amperes

(13) Lh Indicator Display and Rh Indicator Display ..... 10 Amperes

(14) Tilt Position Sensor and Lift Position Sensor ..... 10 Amperes

(15) Transmission ECM and the Sensor for the Lh Brake Pedal ..... 10 Amperes

(16) Implement ECM and Lever Sensors ..... 10 Amperes

(17) EMS, Quad Gauge, Tachometer, and Backlights ..... 10 Amperes

(18) Wiper and Washer for the Front and the Rear Windows ..... 10 Amperes

(19) Payload Control System (PCS) ..... 10 Amperes

(20) Voltage Converter for Radio ..... 10 Amperes

(21) Center Indicator Display ..... 10 Amperes

(22) Spare ..... 10 Amperes

(23) Product Link ..... 10 Amperes

(24) Voltage Converter Memory (Attachment) ..... 20 Amperes

(25) ECAP ..... 10 Amperes

(26) Lh Tail Lamps and Clearance Lamps ..... 10 Amperes

(27) Hood Actuator ..... 10 Amperes

(28) Stop Lamp and Backup Alarm with Lamps ..... 10 Amperes

(29) Horn ..... 10 Amperes

(30) Voltage Converter Memory (Standard) ..... 10 Amperes

(31) Key Start Switch and Machine Security System (MSS) ..... 10 Amperes

(32) Dome Lamps ..... 10 Amperes

i01615750

Hood Tilt Actuator - Lubricate

SMCS Code: 7275-086

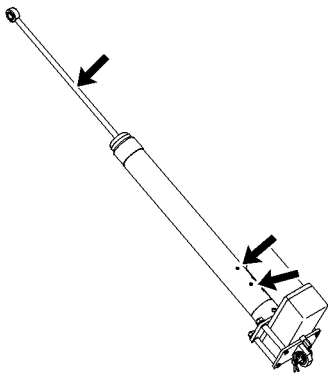


Illustration 209 g00765332

The hood tilt actuator is located on the right side of the machine.

1. Raise the engine hood in order to extend the tilt hood actuator.
2. Remove the wiper and lubricate the entire length of the inner post by hand.
3. Wipe off the fittings before you apply any lubricant. Apply lubricant through the two fittings on the cylinder. Apply approximately 15 to 20 pumps of grease.
4. Close the engine hood.

i01617406

Hydraulic System Biodegradable Oil Filter Element - Replace

SMCS Code: 5068-510

S/N: AYB1-Up

S/N: BAB1-Up

S/N: AYE1-Up

S/N: AYL1-Up

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

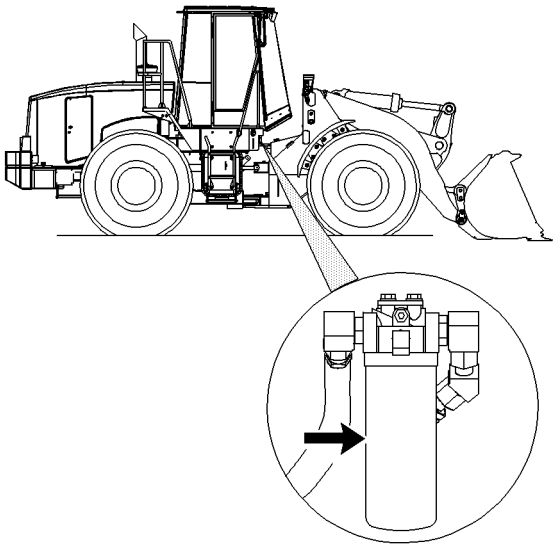


Illustration 210 g00765498

The hydraulic filter is located on the right side of the machine.

1. Use a strap type wrench to remove the filter element. Dispose of the used filter element properly.
2. Clean the filter mounting base. Make sure that all of the used gasket is completely removed.

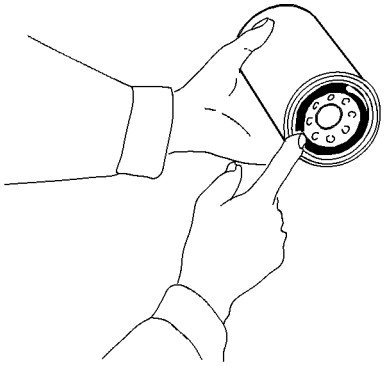


Illustration 211 g00101318

3. Lubricate the gasket of the new filter element with clean hydraulic oil.
4. Install the new filter element by hand. After the gasket contacts the filter mounting base, tighten the filter element by an additional 3/4 turn.
5. Start the engine and run the engine at low idle. Inspect the hydraulic system for leaks.

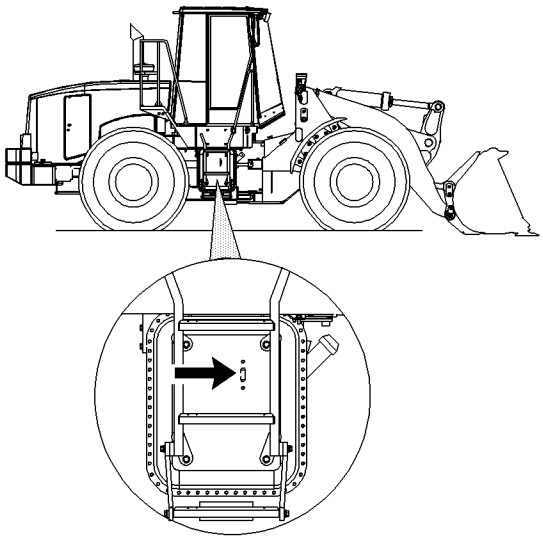


Illustration 212 g00765515

6. Maintain the oil level above the “ADD COLD” mark on the sight gauge. Add hydraulic oil, if necessary.

i01773322

Hydraulic System Oil - Change

SMCS Code: 5056-044

Selection of the Oil Change Interval

Your machine may be able to use a 4000 hour interval for the hydraulic oil. The hydraulic oil is in the system that is not integral to the service brakes, the clutches, the final drives, or the differentials. The standard change interval is 2000 hours. The oil should be monitored during intervals of 500 hours. The extended 4000 hour interval can be used if the following criteria are met.

Oil Filters

Caterpillar oil filters are recommended. The interval for changing the oil filter should be 500 hours.

Oil

The 4000 hour interval for changing the oil is for the following oil types.

- Caterpillar Hydraulic Oil (HYDO)
- Caterpillar Transmission and Drive Train Oil (TDTO)
- Caterpillar TDTO (TMS)
- Caterpillar Diesel Engine Oil
- Caterpillar Biodegradable Hydraulic Oils (HEES)
- Caterpillar Multipurpose Tractor Oil (MTO)
- Heavy-duty diesel engine oils with a minimum zinc content of 900 ppm (CF, CF-4, CG-4, and CH-4)

Note: Industrial hydraulic oils are not recommended in Caterpillar hydraulic systems. These oils are more likely to cause corrosion and excessive wear.

Monitoring the Condition of the Oil

The oil should be monitored during intervals of 500 hours. Caterpillar’s standard SOS Fluids Analysis or an equivalent oil sampling program should be used.

The current guidelines for cleanliness of the oil should be observed. Refer to “Measured Data”.

If an oil sampling program is not available, the standard 2000 oil change interval should be used.

Measured Data

The following information should be monitored through sampling of the oil:

- Significant changes in wear metals should be monitored. These metals include iron, copper, chromium, lead, aluminum, and tin.
- Significant changes in the following additives should be monitored: zinc, calcium, magnesium, and phosphorus.
- Contaminants should not be present. These contaminants include fuel and antifreeze. Water content should be .5 percent or less.
- The silicon level should not exceed 15 parts per million for new oil. The particle counts should be monitored.
- The recommended level of cleanliness for Caterpillar machines that are operated in the field is ISO 18/15 or cleaner. The cleanliness should be monitored by particle count analysis. The levels of contamination should not exceed the normal by more than two ISO codes. Action should be taken in order to determine the cause of the contamination. The system should be returned to the original levels of contamination.
- There should not be significant changes in sodium, silicon, copper, and potassium.
- The allowable level of oxidation is 40 percent (0.12 Abs units).

- The kinematic viscosity of 100 °C (212 °F) should not exceed a 2 cSt change from new.

Procedure for Changing the Hydraulic Oil

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Operate the machine in order to warm the hydraulic oil.

2. Park the machine on level ground. Lower the attachment to the ground and apply slight downward pressure. Engage the parking brake and stop the engine.

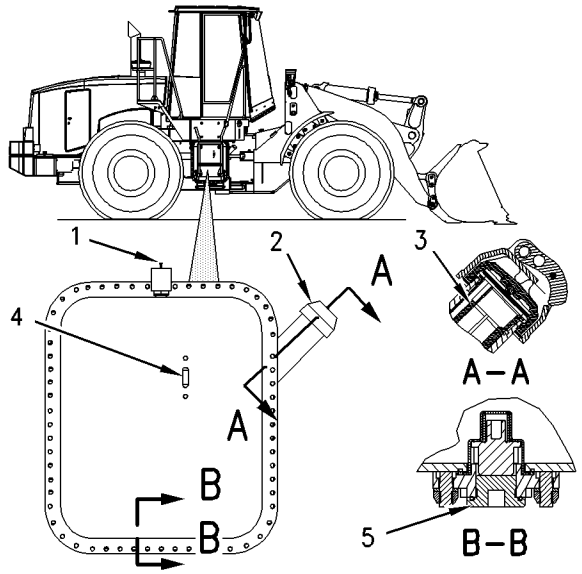


Illustration 213 g00765367

3. The hydraulic tank is located on the right side of the machine. Press the button on the breaker relief valve (1) in order to relieve any tank pressure.

4. Remove the hydraulic tank filler cap (2) and the filler strainer (3). Wash the filler cap and the strainer in a clean, nonflammable solvent. Install the strainer.

5. Inspect the gasket on the hydraulic tank filler cap for damage. Replace the gasket, if necessary.

6. Remove the drain plug (5) from the bottom of the hydraulic tank. Wash the drain plug in a clean, nonflammable solvent.

7. The hydraulic tank is equipped with an ecology drain valve. Attach a hose to a 126-7914 Oil Drain Coupling. Install the threaded end of the coupling into the drain valve in order to unseat the internal drain valve.

NOTICE
Never start the engine while the hydraulic oil tank is being drained or while the hydraulic oil tank is empty. Excessive wear and damage to the hydraulic components can occur.

8. Close the drain valve. Install the drain plug.

9. Change the hydraulic oil filter.

   Reference: Refer to Operation and Maintenance Manual, “Hydraulic System Oil Filter - Replace” for the correct procedure.

10. Fill the hydraulic tank with clean oil. Make sure that the oil level is at the “FULL” mark on the sight gauge (4). Install the filler cap.

    Reference: Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the correct type of oil and for the correct amount of oil.

11. Start the engine and run the engine for at least ten seconds. Then, stop the engine and add hydraulic oil to the tank until the oil level is at the “FULL” mark on the sight gauge. Install the filler cap.

12. Start the engine and run the engine at low idle. Cycle the implements so that all hydraulic systems are filled with oil.

Note: If the alert indicator for a low oil level comes on, stop the engine and immediately add oil to the hydraulic tank. The oil level should not be below the suction ports in the hydraulic tank while the engine is running.

13. Add hydraulic oil to the tank until the oil level is at the “FULL” mark on the sight gauge.

14. Stop the engine. Top off the hydraulic tank so that the oil level is at the “FULL” mark on the sight gauge. Install the filler cap.

Note: The oil must be free of air bubbles. If air bubbles are present in the hydraulic oil, air is entering the hydraulic system. Inspect the hydraulic suction line and the hose clamps.

15. If necessary, tighten any loose clamps or any loose connections. Replace any damaged hoses.

i01465406

Hydraulic System Oil Filter - Replace

SMCS Code: 5068-510

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

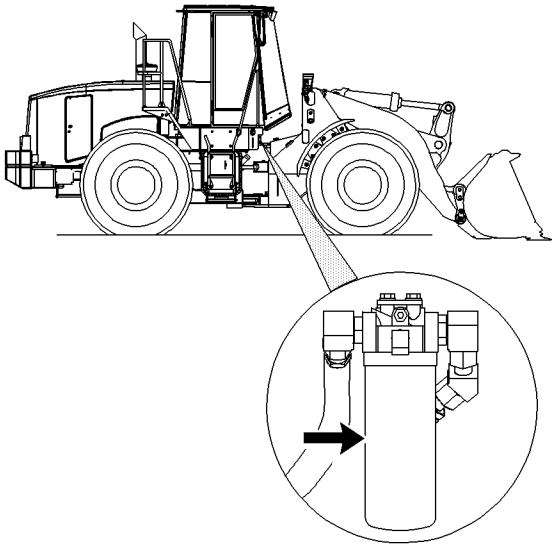


Illustration 214 g00765498

The hydraulic filter is located on the right side of the machine.

1. Use a strap type wrench to remove the filter element. Dispose of the used filter element properly.

2. Clean the filter mounting base. Make sure that all of the used gasket is completely removed.

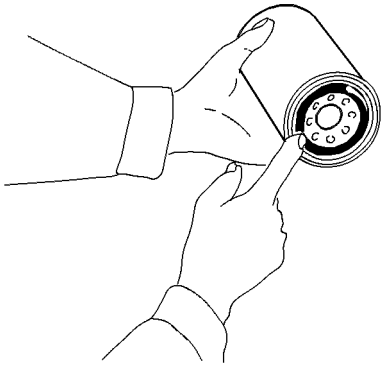


Illustration 215 g00101318

3. Lubricate the gasket of the new filter element with clean hydraulic oil.

4. Install the new filter element by hand. After the gasket contacts the filter mounting base, tighten the filter element by an additional 3/4 turn.

5. Start the engine and run the engine at low idle. Inspect the hydraulic system for leaks.

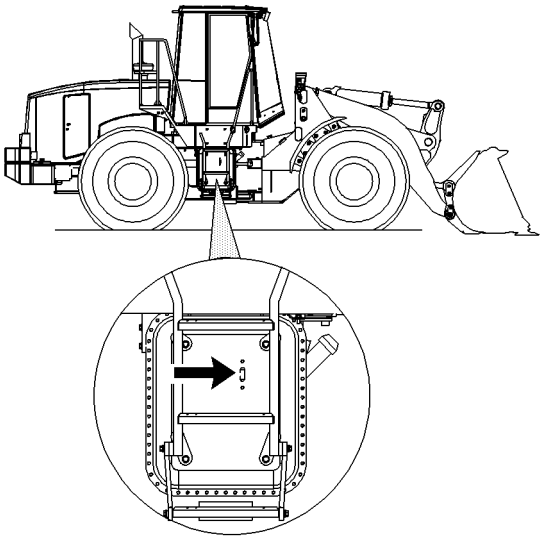


Illustration 216 g00765515

6. Maintain the oil level above the “ADD COLD” mark on the sight gauge. Add hydraulic oil, if necessary.

i01465502

Hydraulic System Oil Level - Check

SMCS Code: 5056-535-FLV

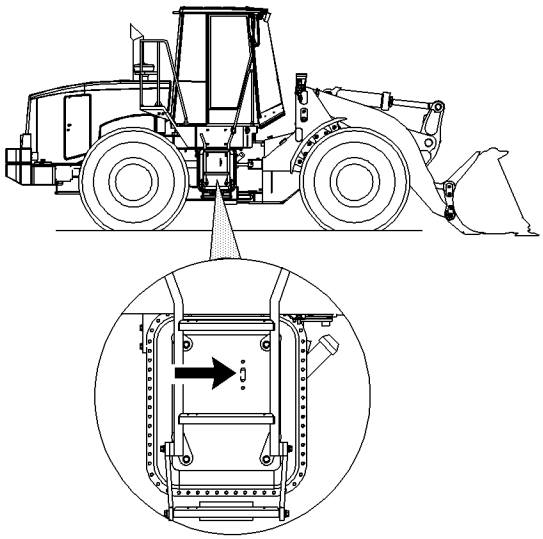


Illustration 217 g00765515

The hydraulic tank is located on the right side of the machine.

Maintain the oil level above the “ADD COLD” mark on sight gauge (2). If necessary, remove filler cap (1) slowly and add oil.

i01912731

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008; 5056-008; 7542

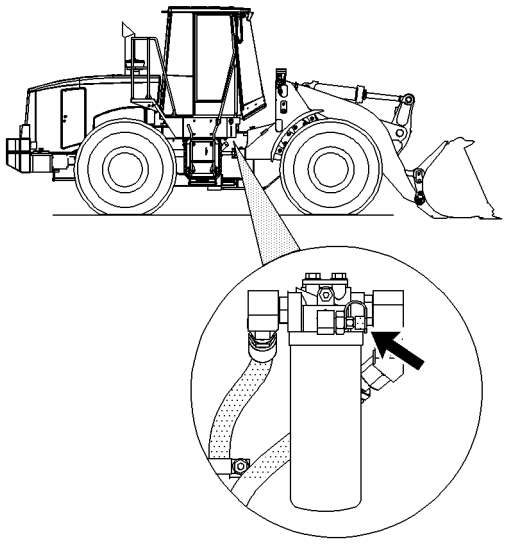


Illustration 218 g00767586

Obtain a sample of the hydraulic oil from the hydraulic oil sampling valve. The sampling valve is located on the hydraulic oil filter base beneath the cab on the left side of the machine. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of hydraulic oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of hydraulic oil.

i01465512

Hydraulic Tank Breaker Relief Valve - Clean

SMCS Code: 5118-070

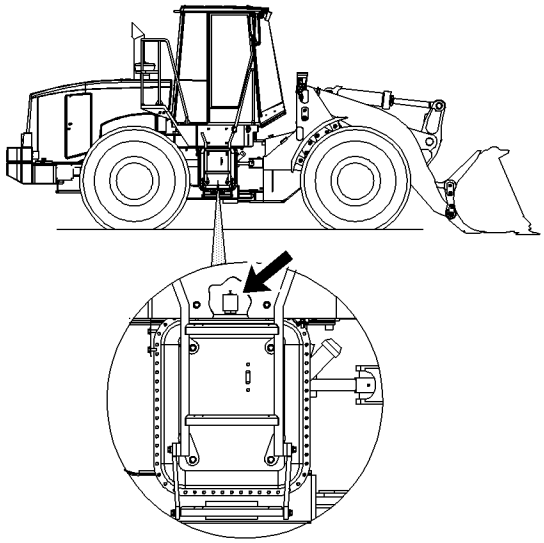


Illustration 219 g00765560

The hydraulic tank breaker relief valve is located on the top of the hydraulic tank on the right side of the machine.

1. Press the button on the top of the hydraulic breaker in order to relieve the pressure in the hydraulic tank. Remove the hydraulic tank breaker relief valve.
2. Clean the hydraulic tank breaker relief valve in a clean, nonflammable solvent. Shake the breaker relief valve dry or use pressure air to dry the breaker relief valve.
3. Install the hydraulic tank breaker relief valve.

i01718807

Logging Fork Clamp - Lubricate

SMCS Code: 6113-086-BD; 6410-086-BD

Wipe off all fittings before any lubricant is applied.

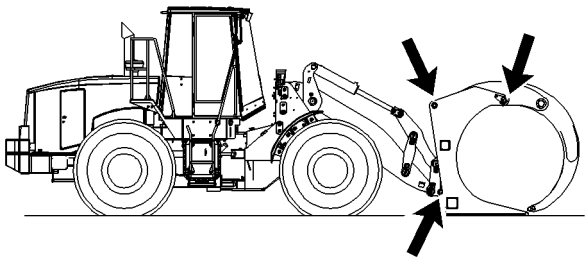


Illustration 220 g00883679

Apply lubricant through three fittings on each side of the logging fork.

There is a total of six fittings.

i02106227

Oil Filter - Inspect

SMCS Code: 1308-507; 3004-507; 3067-507; 5068-507

Inspect a Used Filter for Debris

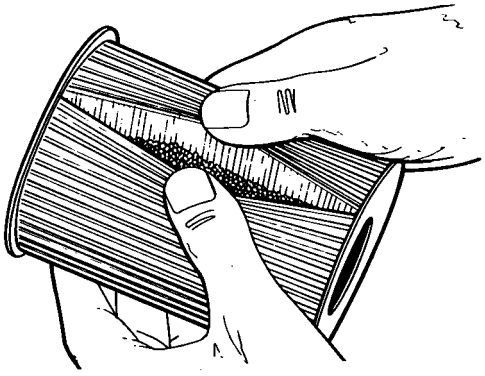


Illustration 221 g00100013

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i01362822

Quick Coupler - Check

SMCS Code: 6129-535

S/N: AYA1-Up

S/N: AYB1-Up

S/N: BAB1-Up

S/N: BAC1-Up

S/N: AYE1-Up

S/N: AYL1-Up

S/N: AXR1-Up

S/N: AXS1-Up

S/N: AYS1-Up

S/N: AXX1-Up

S/N: AXY1-Up

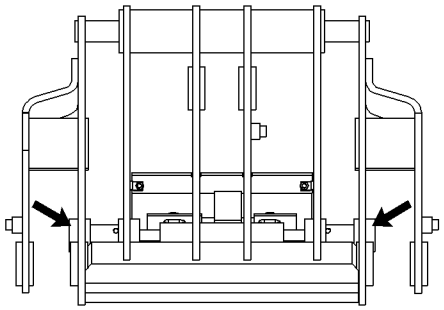


Illustration 222 g00718871

When you install a work tool on the quick coupler, inspect the engagement of the coupler pins. If there is play between the coupler pins and the corresponding bores, inspect the coupler pins and the bores for damage or wear.

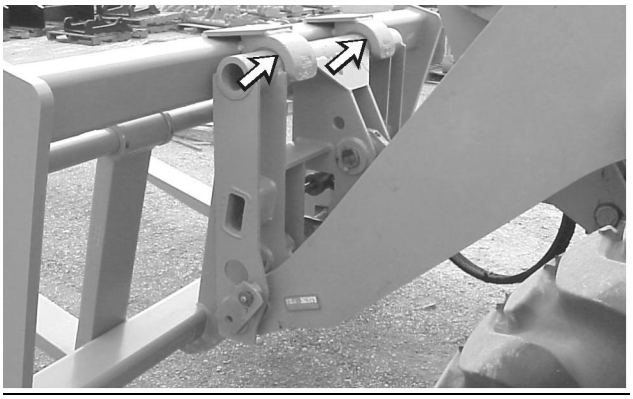


Illustration 223 g00718876

If there is play between the quick coupler and the hooks of the work tool, inspect the quick coupler and the hooks for wear or for damage.

Make any necessary repairs before you operate the work tool.

i01362849

Quick Coupler - Lubricate

SMCS Code: 6129-086

S/N: AYA1-Up

S/N: AYB1-Up

S/N: BAB1-Up

S/N: BAC1-Up

S/N: AYE1-Up

S/N: AYL1-Up

S/N: AXR1-Up

S/N: AXS1-Up

S/N: AYS1-Up

S/N: AXX1-Up

S/N: AXY1-Up

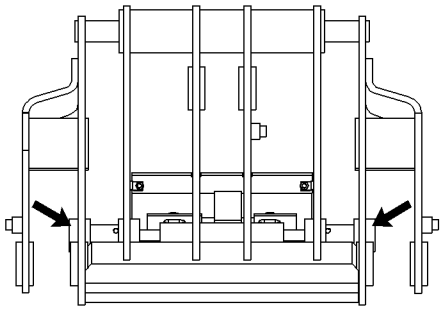


Illustration 224 g00718871

Wipe off the coupler pins. Coat the coupler pins with new grease.

i01442049

Radiator Core - Clean

SMCS Code: 1353-070-KO

1. Open the engine hood. The radiator assembly is located at the rear of the machine.

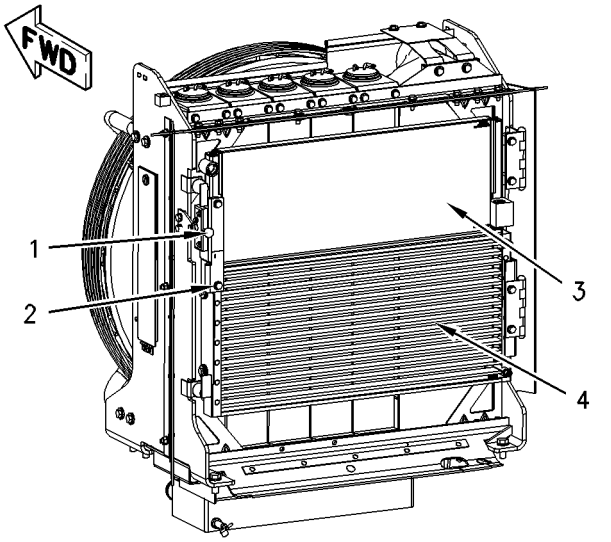


Illustration 225 g00765907

2. Remove bolt (2). Swing the condenser away from the radiator. Use the control knob (1) in order to release the hydraulic oil cooler. Swing the hydraulic oil cooler (3) and the condenser (4) away from the radiator.

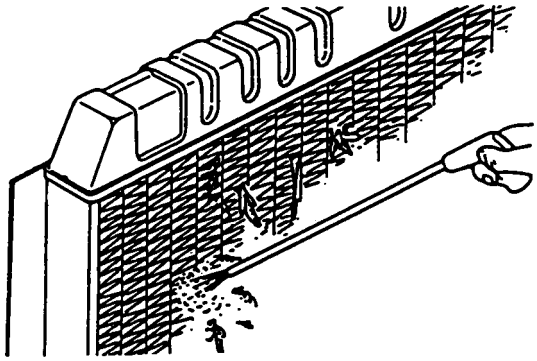


Illustration 226 g00101939

3. You can use compressed air, high pressure water, or steam to remove dust and other debris from the radiator fins. However, the use of compressed air is preferred.

4. Swing the hydraulic oil cooler back into the operating position and replace the two bolts.

5. Swing the air conditioner condenser back into the operating position and replace the two bolts.

6. Close the engine hood.

i02252730

Refrigerant Dryer - Replace

SMCS Code: 7322-510

⚠ WARNING

Personal injury can result from contact with refrigerant.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use precaution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Use a certified recovery and recycling cart to properly remove the refrigerant from the air conditioning system.

NOTICE
If the refrigerant system has been open to the outside air (without being plugged) for more than 30 minutes, the receiver-dryer must be replaced. Moisture will enter an open refrigerant system and cause corrosion which will lead to component failure.

Refer to Service Manual, SENR5664, “Air Conditioning and Heating System with R-134a Refrigerant for All Caterpillar Machines” for the proper procedure to change the receiver-dryer assembly and for the procedure to reclaim the refrigerant gas.

i01157525

Ride Control Accumulator - Check

SMCS Code: 5077-535-R6

The ride control accumulator reduces the pitching of the machine. If the machine seems to be bouncing excessively, check the charge in the ride control accumulator.

Note: Special tools and equipment are required to test the accumulator.

Reference: For more information, refer to Testing and Adjusting, SENR1390, “950G Wheel Loader, 962G Wheel Loader and IT62G Integrated Toolcarrier Hydraulic System” or consult your Caterpillar dealer.

i01457015

Roading Fender Hinges - Lubricate

SMCS Code: 7252-086-HNG

S/N: BAA1-Up

S/N: AYB1-Up

S/N: BAB1-Up

S/N: BAC1-Up

S/N: AYD1-Up

S/N: BAD1-Up

S/N: AYE1-Up

S/N: AYG1-Up

S/N: AYL1-Up

S/N: AXR1-Up

S/N: AXS1-Up

S/N: AYS1-Up

S/N: AXX1-Up

S/N: AXY1-Up

Wipe off the fitting before any lubricant is applied.

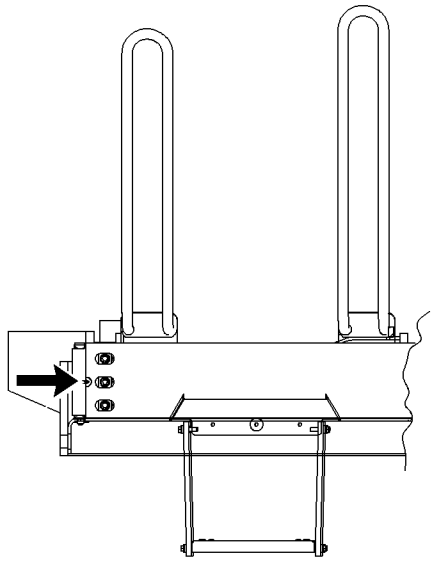


Illustration 227 g00761700

Swing open the roading fender. Apply lubricant through one fitting on the hinge. There is one hinge on each side of the machine.

i01457460

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7323-040; 7325-040

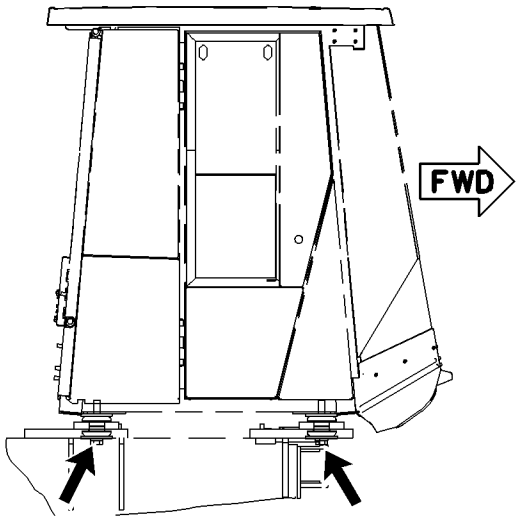


Illustration 228 g00762107

Inspect the ROPS for bolts that are loose or damaged. Use original equipment parts only to replace bolts that are damaged or missing. Tighten the four cab mounting bolts to a torque of 850 ± 100 N·m (629 ± 74 lb ft).

Note: Apply oil to all bolt threads before installation. Failure to apply oil can result in improper bolt torque.

Do not repair the ROPS by welding reinforcement plates to the ROPS. Consult your Caterpillar dealer for repair of cracks in any welds, in any castings, or in any metal section of the ROPS.

i02429589

Seat Belt - Inspect

SMCS Code: 7327-040

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.

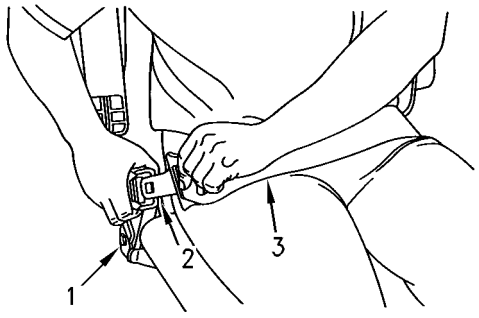


Illustration 229 g00932801
Typical example

Check the seat belt mounting hardware (1) for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect the seat belt (3) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

Note: Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt. Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

If your machine is equipped with a seat belt extension, also perform this inspection procedure for the seat belt extension.

i02429594

Seat Belt - Replace

SMCS Code: 7327-510

Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt . Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

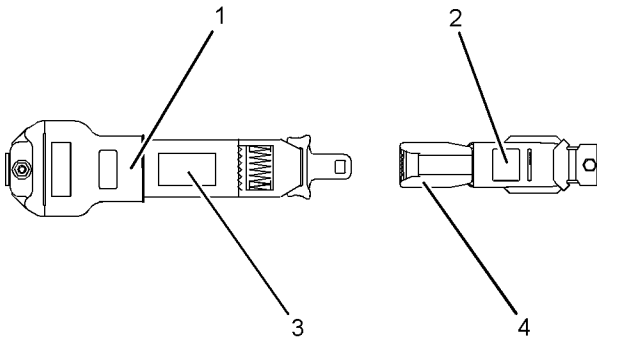


Illustration 230 g01152685

(1) Date of installation (retractor)
(2) Date of installation (buckle)
(3) Date of manufacture (tag) (fully extended web)
(4) Date of manufacture (underside) (buckle)

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i02197967

Service Brake Wear Indicator - Check

SMCS Code: 4255-535-IND

Reference: For information about checking the service brake wear indicator, refer to Testing and Adjusting, “Braking System” for the machine that is being serviced or consult your Caterpillar dealer.

i02405758

Steering Cylinder Bearings - Lubricate

SMCS Code: 4303-086-BD

⚠ WARNING

Crushing Hazard. Insure that the machine ignition switch is in the OFF position and that the parking brake is engaged before entering the articulation area. Failure to do so could result in serious injury or death.

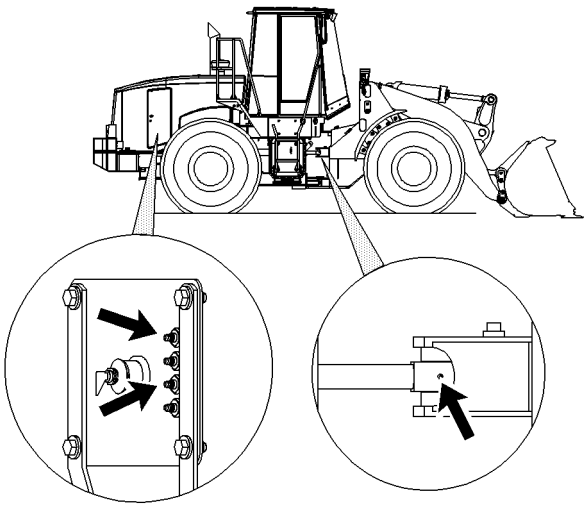


Illustration 231 g00765667

Wipe off the fittings before any lubricant is applied.

Open the access door on the right side of the machine. Apply lubricant through two remote fittings. These remote fittings lubricate the head end of the steering cylinders.

Apply lubricant through the fittings on the rod ends of both steering cylinders.

There is a total of four fittings.

i01467209

Steering Pilot Oil Screen (Command Control Steering) - Clean/Replace

SMCS Code: 4304-070-Z3; 4304-510-Z3

S/N: AYB1-Up

S/N: AYD1-Up

S/N: AYE1-Up

S/N: AYG1-Up

S/N: AXR1-Up

S/N: AXS1-Up

⚠ WARNING

Personal injury can result from working with cleaning solvent.

Because of the volatile nature of many cleaning solvents, extreme caution must be exercised when using them. If unsure about a particular cleaning fluid, refer to the manufacturer's instructions and directions.

Always wear protective clothing and eye protection when working with cleaning solvents.

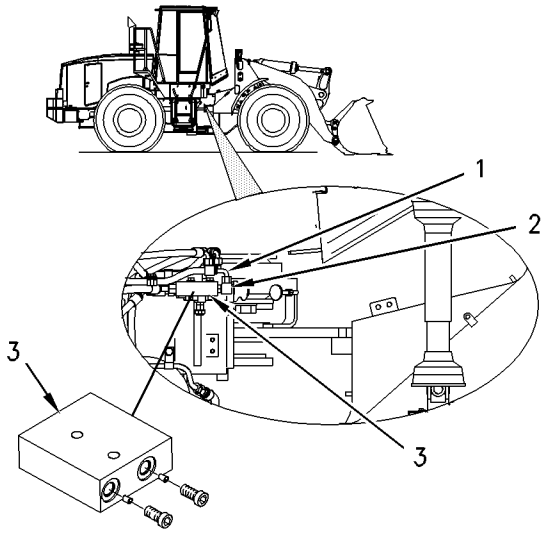


Illustration 232 g00765737

The screen group for the steering oil is located in the articulation joint near the steering neutralizer valve on the right side.

1. Disconnect two hoses.
2. Remove two connectors (2) from screen group (3).
3. Use an allen wrench to remove one screen from each opening of the screen group.
4. Wash the screens in a clean, nonflammable solvent.
5. Dry each screen with pressure air. Inspect each screen for damage. Replace any damaged screens.
6. Install the screens and tighten the allen head screws until the screens are snug.
7. Install two connectors (2) and two hoses (1).

i01619649

Steering Shaft (Command Control Steering) - Lubricate

SMCS Code: 4343-086-JF

S/N: AYB1-Up

S/N: AYD1-Up

S/N: AYE1-Up

S/N: AYG1-Up

S/N: AXR1-Up

S/N: AXS1-Up

Wipe off all fittings before any lubricant is applied.

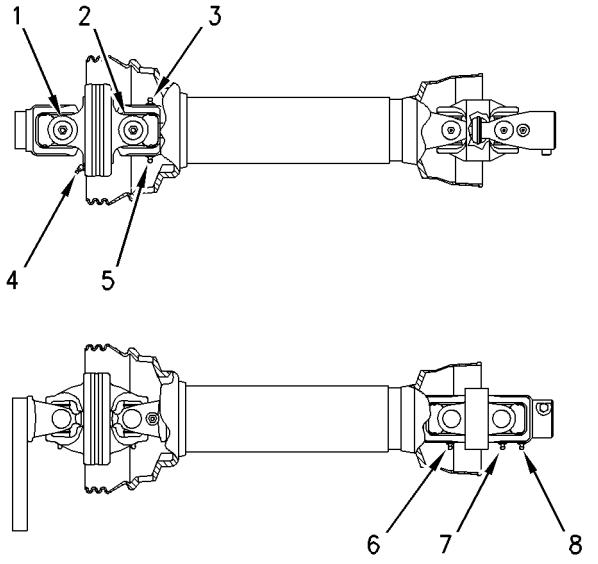


Illustration 233 g00812993

1. Remove the steering shaft from the machine.

Reference: Refer to Disassembly and Assembly, “Steering Shaft - Remove and Install” for the machine that is being serviced for the correct procedure.

2. Apply 5P-0960 Molybdenum Grease through fittings (3), (4), (5) and (8).

3. Apply 1P-0808 Multipurpose Grease through fittings (1), (2), (6) and (7).

4. Install the steering shaft.

i02305841

Tire Inflation - Check

SMCS Code: 4203-535-AI

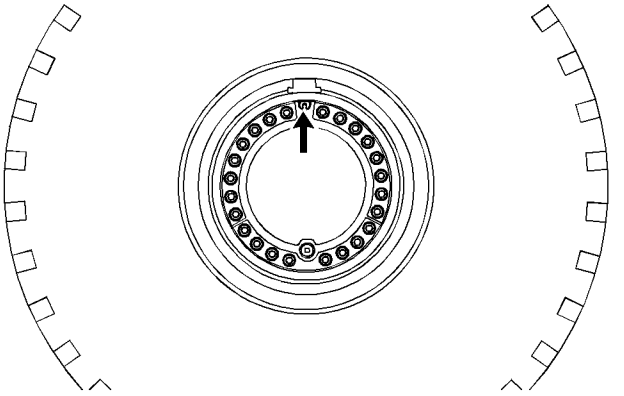


Illustration 234 g01160201

Always obtain proper tire inflation pressures and maintenance recommendations for the tires on your machine from your tire supplier. Measure the tire pressure on each tire.

Inflate the tires with nitrogen , if necessary.

Reference: Refer to the “Tire Inflation Information” section of the Operation and Maintenance Manual for more information.

i01468034

Transmission Oil - Change

SMCS Code: 3030-044

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Operate the engine for a few minutes in order to warm the transmission oil.

2. Park the machine on a hard, level surface. Lower the bucket to the ground with a slight downward pressure. Engage the parking brake and stop the engine.

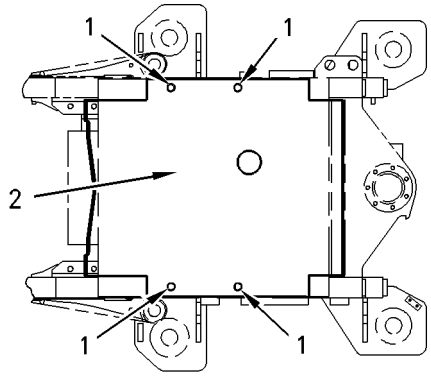


Illustration 235 g00766059

Note: Remove the bolts (1) that hold the transmission guard (2). Remove the transmission guard on the underside of the machine in order to access the magnetic strainer.

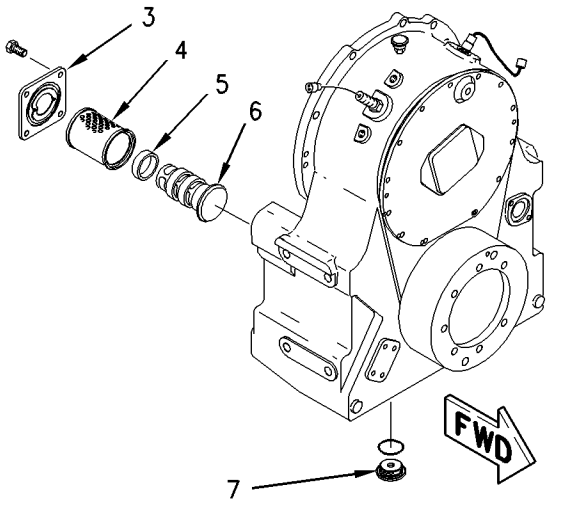


Illustration 236 g00766094

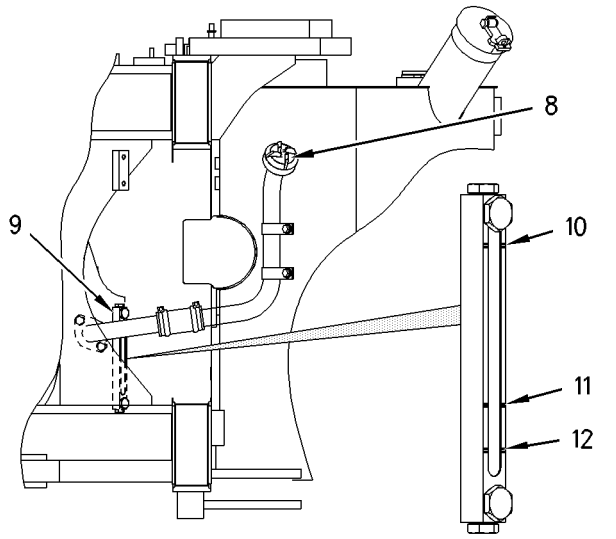


Illustration 237 g00766254

3. Remove transmission oil drain plug (7). Allow the oil to drain into a suitable container. Clean the drain plug and install the drain plug.

4. Remove four cover bolts and magnetic strainer cover (3).

5. Remove suction screen (4) and tube (6) from the housing. Remove three magnets (5) from the tube.

6. Wash the tube and the screen in a clean, nonflammable solvent.

7. Use a cloth, a stiff bristle brush or pressurized air to clean the magnets.

NOTICE
Do not drop or rap the magnets against any hard surface. Replace any damaged magnets.

8. Clean the cover and inspect the cover seal. Replace the seal, if necessary.

9. Install three magnets (5) on the tube. Insert suction screen (4) and tube (6) in the housing.

10. Install the cover and the cover bolts.

11. Replace the transmission oil filter.

Reference: Refer to Operation and Maintenance Manual, “Transmission Oil Filter - Replace” for the correct procedure.

12. The filler tube for the transmission is located near the center hitch. Remove the filler cap (8) and fill the transmission with oil.

Reference: Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities” for the correct type of oil and for the correct amount of oil.

13. Remove the transmission breather from the top of the transfer case. Wash the breather in a clean, nonflammable solvent. Install the breather.

14. Start the engine. Slowly operate the transmission controls in order to circulate the oil.

15. Move the transmission control to the NEUTRAL position. Stop the engine. Inspect the transmission for leaks.

16. Check the transmission oil level. The sight gauge (9) is located near the filler tube. The transmission oil should be at the mark (10) if the engine is off. The oil should be between marks (11) and (12) when the engine is idling.

Reference: Refer to Operation and Maintenance Manual, “Transmission Oil Level - Check” for the correct procedure.

i01468833

Transmission Oil Filter - Replace

SMCS Code: 3004-510; 3067-510

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a hard, level surface. Lower the bucket to the ground with a slight downward pressure. Engage the parking brake and stop the engine.

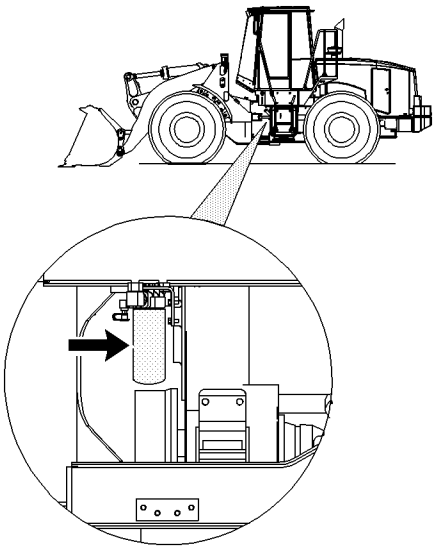


Illustration 238 g00766360

2. The transmission oil filter is located on the left side of the machine near the articulation joint. Use a strap type wrench to remove the transmission oil filter. Dispose of the used oil filter properly.

3. Clean the filter mounting base. Remove all of the used filter gasket from the filter mounting base.

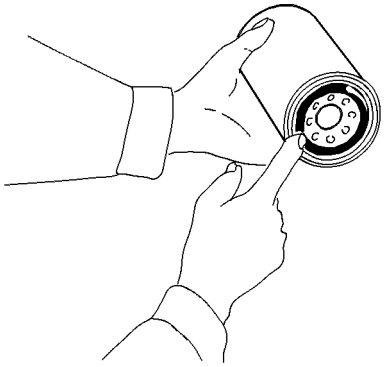


Illustration 239 g00101318

4. Apply a thin coat of clean transmission oil to the gasket of the new filter element. Install the new filter element by hand. When the gasket contacts the filter mounting base, tighten the transmission oil filter by an additional 3/4 turn.

5. Start the engine. Slowly operate the transmission controls in order to circulate the transmission oil.

6. Move the transmission control to the NEUTRAL position. Inspect the transmission oil filter for leaks.

7. Check the transmission oil level.

   Reference: Refer to Operation and Maintenance Manual, “Transmission Oil Level - Check” for the correct procedure.

i01468938

Transmission Oil Level - Check

SMCS Code: 3030-535-FLV

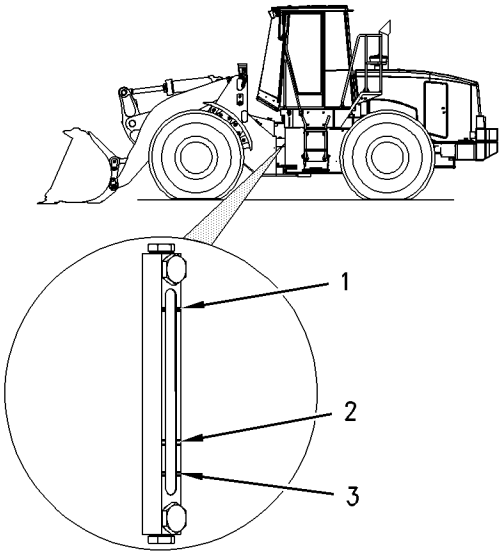


Illustration 240 g00766406

The sight gauge for the transmission oil level is located on the left side of the machine near the articulation joint.

1. Operate the machine for a few minutes in order to warm the transmission oil.

2. Park the machine on a hard, level surface. Put the transmission control into the NEUTRAL position. Lower the bucket to the ground with a slight downward pressure. Engage the parking brake.

Note: Before the machine is started, the transmission oil level should be above “MIN START” mark (1) on the upper end of the sight gauge.

3. Check the oil level while the engine is running at low idle.

   While the engine is running at low idle, the transmission oil level should be between the “MIN” mark (3) and the “MAX” mark (2).

4. If necessary, remove the filler cap and add oil.

i01912832

Transmission Oil Sample - Obtain

SMCS Code: 3080-008; 7542

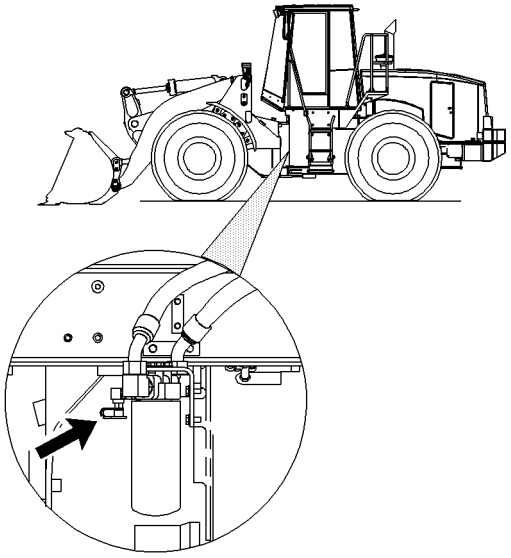


Illustration 241 g00752426

The sampling valve for the transmission oil is located on the transmission oil filter base on the left side of the articulation joint.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “S·O·S Oil Analysis” for information that pertains to obtaining an oil sample from the transmission housing. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining an oil sample from the transmission housing.

i01468974

Window Washer Reservoir - Fill

SMCS Code: 7306-544

NOTICE
When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

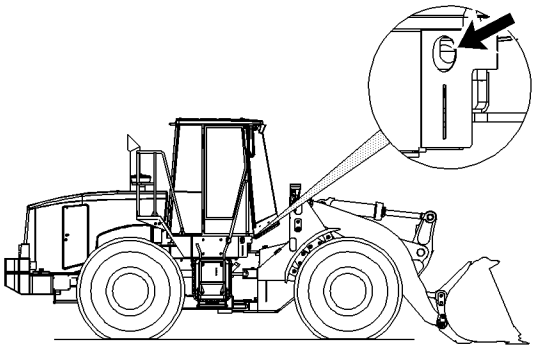


Illustration 242 g00766424

Window Washer Reservoir – The window washer reservoir is located on the right side of the machine. Fill the reservoir through the filler opening.

i01469067

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

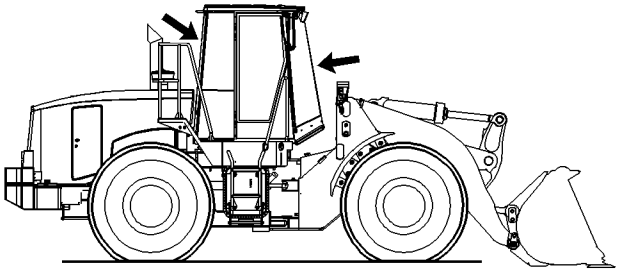


Illustration 243 g00766456

Inspect the wiper blades. Replace the wiper blades if the wiper blades are worn or damaged or if streaking occurs.

i00037755

Windows - Clean

SMCS Code: 7310-070

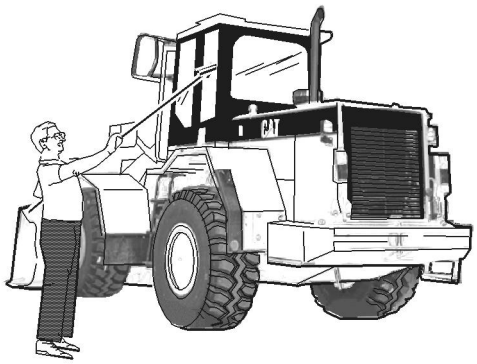


Illustration 244 g00038949

Use commercially available window cleaning solutions in order to clean the windows. Clean the outside windows from the ground unless handholds are available.